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FOUNDED 1872

VOL. CXXXIII. No. 3448 — DECEMBER 24, 1943 — 6d. WEEKLY

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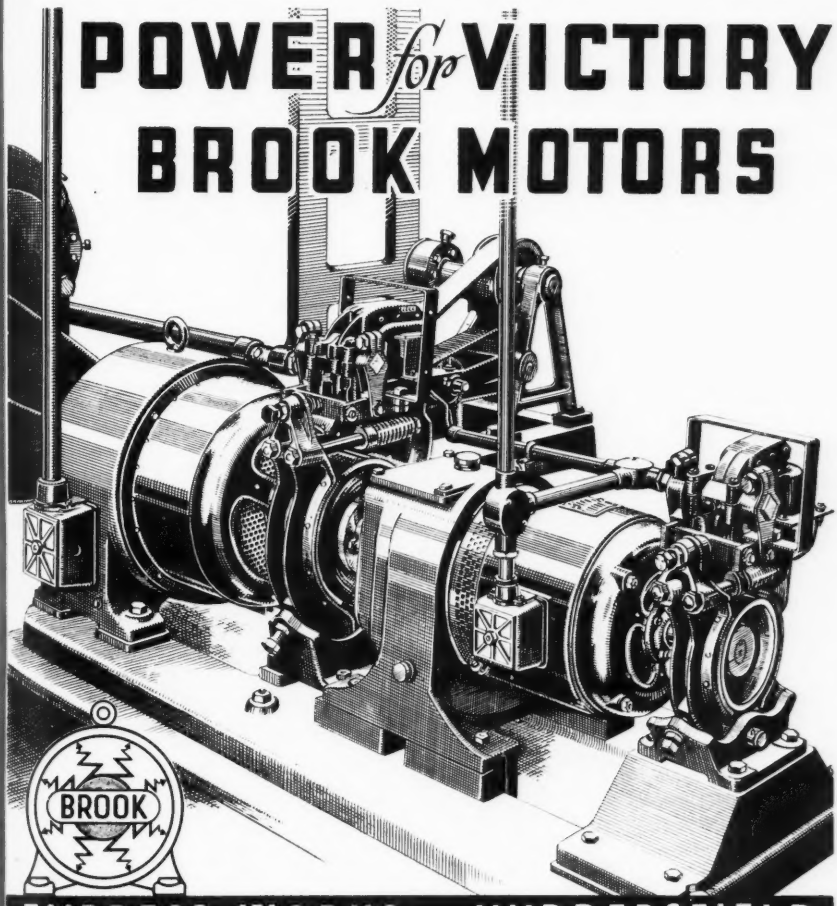

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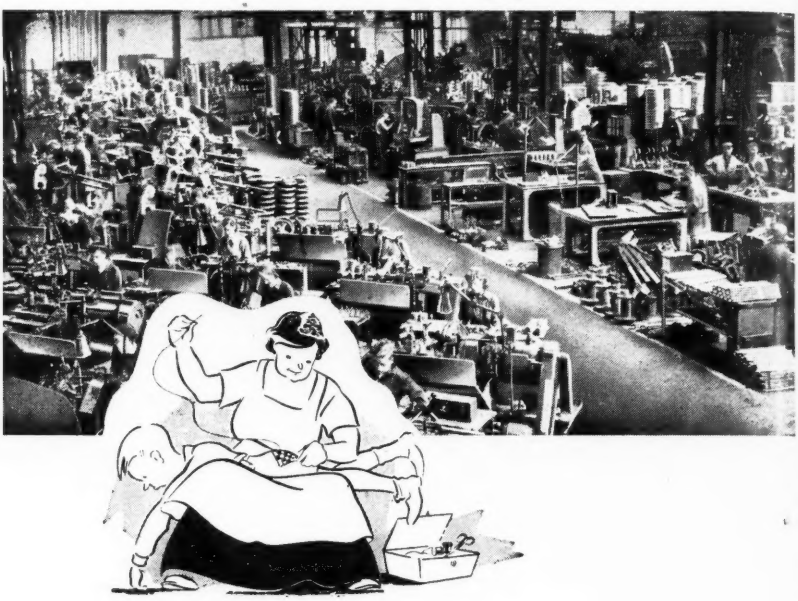

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ELECTRICAL REVIEW

December 24, 1943

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EDITORIAL, ADVERTISING & PUBLISHING OFFICES: Dorset House, Stamford St., London, S.E.1
Telegraphic Address : "Ageekay, Sedist, London." Code : ABC. Telephone No. : Waterloo 3333 (35 lines).
Registered at G.P.O. as a Newspaper and Canadian Magazine rate of postage. Entered as Second Class Matter at the New York, U.S.A., Post Office.
Subscription Rates, Postage free : United Kingdom, £1 14s. 8d. ; Canada, £1 12s. 6d. ; Colonial and Foreign, £1 14s. 8d. per annum.
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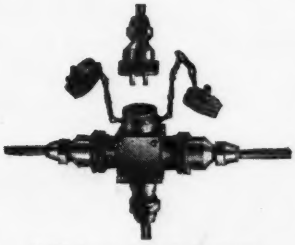

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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

Vol. CXXXIII. No. 3448. DECEMBER 24, 1943 6d. WEEKLY

Electricity Control

The Commissioners' Position

DISCUSSION of the future structure of the electricity supply industry still goes on. The two main issues (unless they can be regarded as one) are whether improvement shall be effected by revolutionary or evolutionary means and whether the industry shall be publicly-owned or controlled or shall remain half-public and half "private."

Naturally the Power Companies' Association and the other company organisations favour the retention of private ownership to a large degree, although they are willing to submit to increased control. The I.M.E.A., on the other hand, favours public ownership although, it is believed, not State ownership. The power companies have asked the I.M.E.A. to study their recent memorandum in the hope that some measure of agreement may be arrived at.

Nationalisation Advocated

The controversy extends to the columns of the daily Press. Last week, for instance, in a discussion of rural amenities in *The Times*, Mr. Walter Higgs, Conservative M.P. for West Birmingham, and a well-known electrical manufacturer, flatly came down on the side of nationalisation, at which Sir Herbert Williams, M.P., in a subsequent letter was "frankly surprised." Sir Herbert, who until about a year ago was executive director of the Power Companies' Association, claims that but for the war the electrification of rural Britain would have been virtually complete by now.

He attributes the slow development of electricity supply in this country to the 1882 Electric Lighting Act sponsored by Joseph Chamberlain (then President of the Board of Trade and member for Mr. Higgs's constituency) which paralysed rural electrification for nearly a generation and gravely hampered urban electrification. In recent years, says Sir Herbert, progress has been amazingly rapid under a combination of municipal and private enterprise—"three times as rapid as that of the nationalised telephone system."

Well Regulated

This reference to control is a reminder that many people profess to believe that the electricity supply industry is in a state of anarchy, whereas, in point of fact, it is subject to as much control as any other public utility service, as is pointed out in another letter to *The Times* by Mr. R. W. Fryer. Our contemporary recently published a survey of the position of the supply industry which made passing reference to the "important and valuable regulatory powers" of the Electricity Commissioners. Mr. Fryer says that these powers have little to distinguish them from elements of public control.

Because of the vagueness of ideas which exist with regard to the powers and duties of the Electricity Commissioners we think that it will be of some service to many readers to be informed of the Commissioners' activities through the article on another page of this issue. Another good reason for the article, as is stated in the introduction, is that amid all the uncertainties of the situation the Commissioners

stand firm. Nobody has suggested their abolition; in fact most schemes for the future envisage an even more powerful Commission and it is not a hazardous prophecy to say that whatever the future may bring the Commissioners will remain as the central direction of the industry.

Nationalisation

IN the foregoing leading article reference is made to Mr. Walter Higgs's advocacy of the nationalisation of electricity supply. He bases his contention on the supposition that this would lead to uniformity of prices in urban and rural areas. But the provision of cheap electricity for farmers is not the whole story. They will want electrical equipment as well and they will want it cheap. Then those others (not manufacturers) who imagine that a nationalised service will result in cheap electricity will inevitably contend that, in the same way, only nationalisation of manufacture will ensure to the farmers their motors, pumping plant, milking machines, etc., at the lowest prices. At the best, considerable pressure would be brought to bear upon manufacturers. We agree with Sir Herbert Williams that Mr. Higgs should re-examine the problem.

Greetings

IT is meet and right in this issue to extend to all our readers, particularly those in the Forces, our best wishes for Christmas and the coming year. Let us hope that this will be the last wartime Christmas and that during the New Year it will be possible to make a real start upon plans for a better future.

The Egham Case

THE House of Lords has confirmed the judgment of the Court of Appeal in the Egham street-lighting case. It will be remembered that the Egham and Staines Electricity Co. sought to recover £3,590 from the Egham Council in respect of a street-lighting contract and succeeded in the High Court. The dispute hinged on the interpretation of a clause in the contract by which the company avoided liability to damages for any default made by causes beyond its control. The Lighting Restrictions Orders were obviously of this character. But the same clause also enabled the Council to abate payments in proportion to the curtailment of the supply of lighting. It has now been established that total curtailment means total abatement and therefore the Council is not liable to pay the company anything while the restrictions prevent the contract from being carried out. The company's counsel urged that a supply of electricity was being given but was not used. The House of Lords held that the contract was for the supply of *lighting* not electricity.

Unnotified Appliances

IT seems to be virtually impossible for electricity supply authorities to keep track of the appliances connected to their systems by consumers without notifying the authorities. Until a cold snap occurs it may not be realised, for instance, how many electric fires are likely to be used all at once. Ordinarily, we suppose, this connection without notification has no serious results upon the system as a whole, whatever may be the effect upon the individual installations. The demand due to their use is indicated pretty regularly on the station's meters. But notification enables the undertaking to keep an eye on appliances and their installation for the consumers' own benefit. It is stated that at Fort William unnotified cookers of heavy loading have been connected to lighting sockets accompanied (we presume) by the "strengthening" of fuses.

B.B.C. Slip

THERE is no doubt that much confusion exists in the minds of electricity consumers regarding the make-up of their bills. This was made worse confounded by the B.B.C. in a recent talk when it was said that the standing charge of two-part tariffs had been reduced from 25s. to 10s. per annum. An explanation and apology was broadcast last Monday after many supply undertakings had been pestered by inquiries from consumers. Such slips are inexcusable when E.D.A. is always ready to give advice and "vet." scripts of this type, and the interval before the correction was made was far too long.

Fuel Economy?

A WOMAN was fined at Andover last week for an infringement of the black-out regulations. She said in extenuation of the offence that before she went out for the day she switched on a light to warm the room and it was left on. This seems to be carrying fuel economy to extremes. It also suggests that we are still far from our goal of the "cold" light.

Electrolytic Tinplate

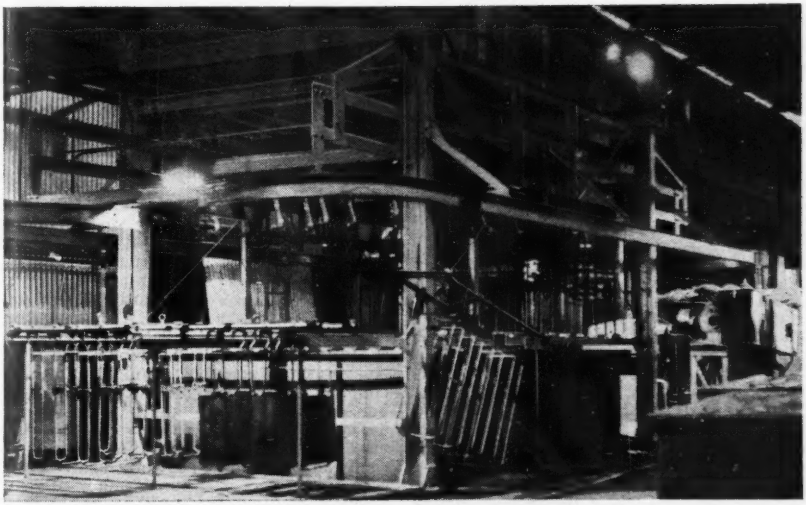
Experimental Plant for Handling Single Sheets

SINCE the loss of Malaya early in 1942 various investigations have been undertaken with a view to conserving available resources of tin, especially in the tinplate industry which, absorbing in normal times approximately 40 per cent. of the country's tin consumption, offers the greatest scope for economy. Hot dipping, the process hitherto generally adopted for coating tinplate, requires about 1¼ lb. (0·00009 in.) per basis box (112 sheets, 20 in. by 14 in. or 62,720 sq. in. surface), and it is difficult to apply a coating of much less than 16 oz. (0·00006 in.) per box. Electro-deposition, however, permits any desired thickness of the metal to be applied. Although first experiments were aimed at giving a coating of 2-3 oz. per box, 4 oz. (0·000015) has been found to be the practical minimum, representing a saving of over 80 per cent. of metal as compared with hot tinning.

In the United States several continuous electro-tinning plants have been in operation for some time, treating steel strip at the rate of 500 ft. or more a minute. This is obviously the way to handle large quantities of steel plate on mass production lines, but small-scale manufacture may not justify such an elaborate installation. To meet the latter requirements the Research Department of the Welsh Steel & Plate Manufacturers' Association has for the past year been investigating the possibility of developing apparatus suitable for the treatment of single sheets.

As an outcome of this research work there has been erected at the works of one of the members of the Association a " pilot " plant, which, although of an experimental nature, is of sufficient size to be operated on a sound manufacturing scale. When applying 4 oz. of tin a box, it does in fact provide very much the same output as a hot tinning plant, namely, 1,000-1,200 boxes a week (working three shifts a day). Actually the plant is an adaptation of an automatic unit developed by the Electro-Chemical Engineering Co., Ltd., for plating bright nickel and chromium steel automobile and bicycle components as a continuous process.

Four tanks are embodied in the plant, each measuring 3 ft. 6 in. by 8 ft. 3 in. by 3 ft. 2 in. and holding 500 gal. Only the first is used for electro-deposition, the other three being employed respectively for collecting and recovering dragged-out electrolyte for re-use; for a cold-water wash (which is made slightly alkaline and is agitated by compressed air); and for a hot-water



A general view of the plant for electro-tinning single sheets

wash (heated by steam, thermostatically controlled).

In the electro-deposition tank the anodes, which weigh about 40 lb. each and are shaped like cricket bats, are hung on ten busbars, connected with the positive supply, spaced 10 in. apart across the top of the tank. Jigs, which are designed to hold ten sheets for treatment at one time, have been specially constructed of brass rod coated with rubber. They have notches in the base of each hairpin-shaped carrier with distance pieces adjustable to hold sheets of any size in a vertical position, so that the only portion of the plates not coated are minute sections of the edges at the bottom. At each end of the jig carriers are inverted V-shaped bars which, when the sheets are immersed, are supported on and connect with triangular contacts at the side of the tanks, thus completing the circuit.

Owing to the spreading effect of the deposition, which is analogous to that of a magnetic field, the size and shape of the anodes in relation to the sheets has to be carefully regulated to avoid a heavier coating similar to that usually noticeable on the "list" edge of sheets which have been hot dipped. As the size of the sheets, too, is not always the same, the position of the anodes has to be adjusted on the busbars if a uniform coating is to be obtained.

A portion of one of the tanks showing method of suspending the anodes and (on the right) one of the triangular bar contacts on which the jigs rest

Although as at present operated the plant is working with a current density of about 20 A per sq. ft. (at 2·2-2·4 V) the electrolyte used (a stannous sulphate solution with certain additions to give suitable smooth coatings) would stand up to a considerably higher current density. The restricting factor is the capacity of the rectifier equipment, a Westinghouse "Westalite" selenium unit giving 1,500 A at 8 V and fitted with auto-transformer control. To impart a 4-oz. coating takes approximately 25 seconds, an ammeter giving an indication of the amount of tin deposited.

Once the plant has been set up, the process is fully automatic, the only manual operation being the loading and unloading of the sheets on and off the jigs. The elimination of handling between operations has been achieved by the use of a duplex carriage transfer plant which consists of two moving carriages on a steel structure, with chains suspended from the upper carriage and passing over pulley wheels on the lower carriage. By this arrangement either the upper carriage can be moved alone or both carriages together. To the chains suspended from the upper carriage is fixed a frame or bars carrying lifter hooks. The hooks engage with bars carrying the jigs holding the plates to be treated.

The actual sequence of operations is as follows:—(1) The upper carriage moves in a forward direction and raises the lifter hooks and jig; (2) both carriages move forward, taking the jig forward from the loading point to the first tank; (3) the upper carriage moves backward, lowering the hooks and jig into the first tank; (4) both carriages move forward, disengaging the hooks and leaving the jig in the tank; (5) the upper carriage moves forward, tightening the chains and lifting the hooks alone; (6) both carriages move back, returning the hooks for the next transfer; (7) the upper carriage moves back and lowers the hooks; and (8) both carriages move back to the starting position, the first set of hooks engaged with a new jig at the loading end and a second set of hooks with a jig in the first tank. After the predetermined time the cycle is automatically repeated and each set of jigs is immersed in turn in each tank.

Only one motor is required to operate the plant. The drive unit, which is fitted to a bedplate carried on top of the apparatus, consists of a 3-HP, 380-V, three-phase, 475-RPM, s.c. induction motor, with an AC brake, connected through a flexible coupling to a single reduction worm gear box.

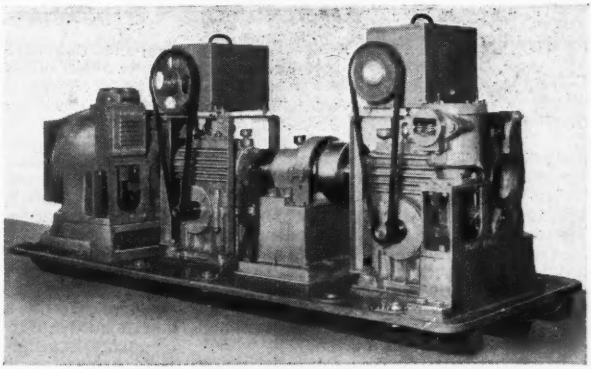
The output shaft of the worm gear box drives the upper carriage through a rack, chain and pinion. The worm shaft of the gear box has an extension giving a straight-through drive to a magnetic clutch, the armature of which is connected to the worm shaft of a second gear box. The output shaft of the second gear box drives the lower carriage through a sprocket and rack chain. The extension shaft of the second gear box carries a pulley on which a DC brake operates.

The necessary DC is provided by a small copper oxide rectifier. The DC brake is connected in series with the magnetic clutch, so that the brake is applied to the lower

carriage drive when the clutch is released.

The hooks are raised or lowered by driving the upper carriage only through the first gear box. A forward motor rotation raises the hooks and reverse rotation lowers them. The hooks can be made to travel forward or backward by exciting the clutch and removing the lower carriage brake: both gear boxes then drive together. It will be appreciated that all the operations mentioned above can be obtained by running the motor in forward or reverse, either with or without the clutch in operation.

Controlling the various operations is a single master rotary controller driven by a fractional-HP motor and working in conjunction with two rotary limit switches actuated by the carriage drives. The circuit is arranged with contacts in pairs so that each movement of the plant is electrically interlocked. A Venner time switch is used to restart the cycle after a predetermined time. As only a single motor is used for both lifting and traversing operations, there is no possibility of these motions getting out of synchronism. Control of the plant is normally carried out from the main switchboard, but there are emergency switches placed at three points on the plant.



The duplex carriage drive unit, showing from left to right the motor, AC brake, upper carriage gear box, magnetic clutch, lower carriage gear box and DC brake. The rotary limit switches are mounted on top of the gear box

As the sheets when they leave the electrodeposition plant are wet, they are taken to a small drying plant where they are passed through a pair of heated swansdown rollers and then through a current of cold air. When the jigs have been emptied they are returned to the loading end by means of monorails along either side of the plant.

Electrification of Refuse Works

AN interesting example of the way in which the use of electricity gradually develops is to be found at the refuse disposal and sewage works of the Surbiton Town Council. When the works were established in 1913 all the sewage pumping was carried out by steam generated from the combustible refuse, the steam also being used to produce the comparatively small amount of electricity required for the lighting and the various small motors in use (100-V DC).

In 1933 a further stage in the electrification was reached by the installation of an 80-HP, 400-V, 600-RPM, three-phase AC Diesel-generator. If the necessary steam supply could not be maintained (owing to lack of suitable refuse for burning) this machine provided an alternative means of operating the pumping plant. One of the pumps, a vertical unit, was converted completely to operation by a 40-HP, 960-RPM motor. A motor of similar size but designed for two-speed operation (480 and 960 RPM) is used for a horizontal pump, a clutch arrangement permitting either electrical or steam operation to be used. The third pump, another horizontal unit, is at present steam operated but it is proposed to convert this shortly to electricity by installing a 50-HP motor. Belt-driven from the Diesel plant is a small 100-V DC generator running at 1,400 RPM for driving the small motors (fractional HP up to 8 HP) employed.

Since the installation of the Diesel generating set there has been a gradual change-over of the DC driven plant to AC, the only apparatus now being operated by DC motors being a bucket-type gantry grab employed for handling sewage sludge. As this is used only about once in three months, it has not yet been considered worth while converting it to AC. The only steam-operated generator now retained, a 12-kW, 100-V, 375-RPM DC machine can be utilised for driving this plant if it is not desired to start up the Diesel generator.

The most recent development, just being completed, resulting from the still lower calorific value of the refuse available to-day, is the provision of facilities for taking the whole of the electrical load from the local supply undertaking, the London & Home Counties Joint Electricity Authority, keeping the Diesel plant purely as a standby. Special electrical and mechanical interlocking devices ensure that it is impossible for both supplies to be connected simultaneously. Ellis & Ward, Ltd., have been responsible for the whole of the electrical equipment and its installation.

Mining Equipment

Research and Certification

THE origin and present state of research into and the routine testing of electrical apparatus of many kinds utilised in coal mines, as well as in other industries in situations subject to risks of explosion, are reviewed in some detail with a view to future development in a long memorandum prepared by senior technical officers of the Safety in Mines Research Board and of the Ministry of Fuel and Power (Coal Division). The document has been prepared primarily for the information of the Minister and is not ordinarily available, but it contains so much matter of interest with proposals for future betterment that a limited number of copies has been circulated to professional, trade and educational bodies and individuals.

It is too wide in scope for summarisation in the ordinary way, but it may be said that the conditions under which the testing for certification of flameproof enclosure is officially undertaken have already been clearly defined in a general memorandum while the structural requirements for such apparatus, which are based on research, are embodied in B.S.S. 22—1940. There is such a large variety of inflammable gases and (liquid) vapours in different industries which necessitate the enclosure of electrical gear that, until convincing proof is adduced in favour of their classification according to chemical characteristics, the only reasonable basis for grouping them is the experimental ascertainment of the safe gap dimension of the enclosure appropriate to each.

Intrinsic Safety

With few exceptions, the electrical characteristics of intrinsically safe apparatus, or circuits, have not been laid down anywhere; thus relative memoranda are unavoidably limited to generalities, affording little design guidance to manufacturers. Such indefiniteness arises from the fact that the incendivity of an electric spark is an involved function of a number of circuit variables, including voltage, current and inductance, so that it is not possible with the available information to forecast the effect of any particular combination of these factors.

The limits of current and voltage prescribed for bell signalling circuits make intrinsic safety possible, but do not ensure it; the values have not been determined by tests and there is nothing fundamental in such criteria. The present state of knowledge does not allow of the formulation of a general specification of electrical characteristics to secure the quality known as intrinsic safety, but the routine testing of similar articles would be simplified by restriction of variety, which is a proper object of standardisation.

The functional efficiency of flameproof apparatus is provided for in BSS. 229—1940, but in the case of some intrinsically safe gear (exploders) it is the direct concern of the testing authority rather than of the manufacturer. In suitable instances regular consultation with users might be the means of improving functional efficiency.

Control of Manufacture

Official certification for safety is necessarily based upon type tests, which are rarely made on more than one sample. Check testing on a scale adequate to ensure that the standard of quality is maintained in repetition manufacture is impracticable for most of the products dealt with in the memorandum. There is not at present any explicit ground upon which any application for the certification of apparatus can be refused, other than failure to satisfy certain prescribed conditions and to pass tests. It is suggested that the British Standards Institution's procedure for the issue of its registered mark might usefully be applied to the issue of certificates of flameproof enclosure and intrinsic safety.

There is scope for further general research that might contribute to the better understanding of flame propagation and extinction.

Periodic review of certificates and the provisional approval of apparatus is desirable as a routine procedure; but, to be effective, there should be collateral arrangements for keeping the testing authority and research staff informed of the behaviour of apparatus in service. Provisional approval of apparatus of novel design, for which statutory approval is required, would afford a means of proving the serviceability of features with respect to which laboratory tests are inapplicable. Life, or endurance, tests should be made, when practicable, as part of the laboratory tests.

With regard to certification on behalf of other Government Departments, in the absence of national or other agreed standards of construction for the apparatus submitted, the testing authority (when it is not also the approving authority for the industry or purpose for which the article is designed) should issue a report on the results of the tests applied, but not a certificate. When agreed standards do exist it is preferable that the testing authority should issue the certificate.

Agreement is desirable with responsible bodies in respect of standards of construction and conditions of use, to avoid giving currency to different standards for the same article.

Domestic Refrigeration

Post-War Prospects

THE subject of domestic electrical refrigeration was discussed at a meeting of the British Association of Refrigeration in London last week. Miss Caroline Haslett, C.B.E. (Electrical Association for Women) spoke from the point of view of the consumer and Mr. E. G. Batt (chairman, Commercial Electric Refrigeration Association) represented the manufacturers. There was subsequently a general discussion.

Women's Demands

Miss Haslett pointed to the need for refrigeration in all homes in the interests of good health and said there was a large demand by women for refrigerators in new houses as necessities, not luxuries. She said that while it was recommended in an interim report issued by her Association on post-war planning that a refrigerator of from 2 to 3 cu. ft. capacity should be regarded as the minimum, it had since been made known by the manufacturers that a 4 cu. ft. refrigerator could be supplied at very little extra cost, and it was felt that this would be a more suitable size for the small house or flat.

Desirable features in post-war refrigerators would be a lamp inside and a foot-operated door; the height from the floor should be sufficient to allow of cleaning underneath or the refrigerator should be sufficiently high to have cupboard space below it. There should be a recess underneath the refrigerator to allow for the housewife's feet to go under. After making a number of other suggestions, such as a transparent door and automatic de-frosting, she urged that the refrigerator should be an integral part of the kitchen equipment, that dimensions should be standardised and that there should be co-operation between manufacturers of electric refrigerators on these and other details.

Miss Haslett emphasised the value of the education of housewives in handling refrigerators and other domestic electrical apparatus and exhibited pictorial diagrams of a refrigerator which are to be used for teaching young girls in schools. She suggested that the services of "electrical housecraft advisers" should be made use of to educate housewives.

Manufacturers' Views

Mr. E. G. Batt remarked that manufacturers in this country would be quite ready to meet the demand for electrical equipment of new houses as soon as world conditions and Government restrictions allowed. Domestic electric refrigeration had hitherto been used in the United States to a relatively much greater degree than in this country, but the climatic conditions made the use of refrigerators more or less essential. Refrigeration, as such, owed its origin to Great Britain.

The Association of which he was chairman comprised the leading manufacturers of electric refrigerators in this country who had pooled their technical resources and experience in designing a refrigerator which could be an integral part of the kitchen. A refrigerator having a net capacity of not less than 4 cu. ft. was required as the minimum for the average household. The external dimensions of such a refrigerator would be of the order of 24 in. wide by 19 in. deep by 42 in. high, with the complete cabinet at service height, with cupboard space above and below, thus effecting the utmost economy in floor space. With this arrangement it would be only necessary to fully finish the front of the refrigerator.

Interchangeable Units

In addition to large and adequate storage capacity, the new refrigerator would have ample shelf accommodation, low running costs, fully automatic and interchangeable air-cooled unit and an ice-making unit. The complete cold producing component would be mechanically interchangeable as between the different makes and easily removed for inspection or replacement to ensure continuity of service. The consumption would only be approximately 1 kWh per day.

Provided the cabinet was fitted with the modern "touch-type" release handles, it would not appear necessary to consider foot-pedals. While agreeing that an interior light should be fitted, he hoped that the user would not think the refrigerator was out of use if the filament of the lamp broke and immediately send for the service engineer. Manufacturers would continue to supply complete self-contained domestic cabinets, as hitherto, in a variety of sizes and designs.

While in general agreement with the suggestions Miss Haslett had made regarding the desirable features, he said the prime cost of the equipment must not be overlooked. Special containers might be regarded as part of the general kitchen equipment and it would therefore be better to arrange that they should be purchased separately. The possibility of manufacturing plastic containers would not be overlooked by the manufacturers.

Standardisation was undoubtedly of great

importance, but it should not be carried to a degree which in any way limited the scope and ingenuity of the designer. Where it was possible to arrange interchangeability of complete equipment, or parts of equipment, by standardisation then this should be supported by all concerned. He suggested that there should be a conference of the users and manufacturers of all the principal items used in the kitchen so that the best lay-out might be designed.

If refrigeration as an industry was to keep its proper place it was essential that there should be an adequate number of properly qualified and trained refrigerator engineers. This was something which might properly engage the attention of the British Association of Refrigeration. Finally, he assured Miss Haslett and all concerned with the women's side that all their views and suggestions would receive proper attention from the manufacturers and that when the time came for supplies of the "people's refrigerator" British manufacturers would not be found lacking.

Discussion

The discussion was opened by Mr. W. B. Daniels, who, speaking of some of the broader issues which confronted the manufacturer, said that if the British public was to have the benefit of United States experience and development, close Anglo-American co-operation was of the greatest importance. With a much higher pre-war standard of living in the United States than here, domestic refrigeration was being marketed at half the price and while that was not the only factor in the high public acceptance of refrigeration it was an important contributory factor.

The price of the refrigerator must be so reduced that it could be embraced within the standard of living at the lower income. That could only be achieved by large volume for burden absorption; reasonable labour costs; reasonable material costs; and reasonable distribution costs.

The work of Miss Haslett and her staff, and the projected plans, gave encouragement to the manufacturer to spend, tool up and produce a product which the homes of this country needed. At the same time they must ensure that it would be entirely free from costly service and maintenance. The sealed type of unit giving this freedom had reached a high degree of development in the United States and must be produced in this country.

Regular De-frosting

Mr. E. A. Lever pleaded with Miss Haslett, when she was teaching housewives, to emphasise that the evaporator prevented the refrigerator from working properly. There must be de-frosting once a week. The filaments of interior lamps were too easily broken by the banging of the door.

The average retail price of the domestic refrigerator in America in 1939 was $180 and in 1940 it had dropped to $152. That was something like £30 and there were plenty of refrigerators in this country at about that figure before the war. Nevertheless, it was generally hoped that the post-war electric refrigerators would be very much cheaper.

Mr. F. J. Clayton suggested that there should be collective advertising by manufacturers and they should set up something in the nature of a Refrigerator Marketing Board. There had been much wasteful advertising and in a number of cases the various advertisements tended to kill themselves. It was necessary to educate people to the required standard before sales could be effected, and that should be done collectively rather than individually.

Mr. Evans expressed the view that the built-in refrigerator was an entirely wrong idea because it was generally placed close to the cooker and with a great deal of moisture in the air the evaporator was covered with frost in a very few days. In building in flush-finished cabinets the difficulties of the servicing engineering would be considered.

Supply Authorities' Part

Mr. A. E. Marchant (deputy borough electrical engineer, Barking) said that in speaking of refrigerators for the million it should not be overlooked that it was the supply engineer, who was in regular touch with consumers, who could render the greatest service in getting them installed.

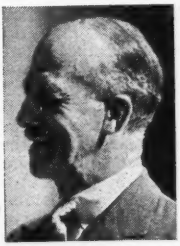
Lord Dudley Gordon said the manufacture of domestic refrigerators had been stopped in this country and also in the United States, because they were not considered a necessity. Perhaps some people in America had seen what was coming because, a year before manufacture was stopped, the sale of domestic refrigerators jumped from 2,000,000 to 3,200,000, which indicated what manufacturers here had to be prepared for.

Mr. Batt, commenting on some of the points made in the discussion, said that his Association was working in collaboration with E.D.A. and that Association would arrange for the necessary advertising and propaganda. E.D.A. had a joint committee with the architects. It was impossible at the moment to say anything about the price of the new refrigerator owing to inability to foresee what labour and material conditions were likely to be. As regarded lay-out, he agreed it would be wrong to place the refrigerator next to the cooker. The work of the servicing engineer had received the closest attention of the manufacturers.

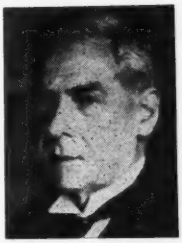
The Electricity Commission

Manifold Powers and Duties

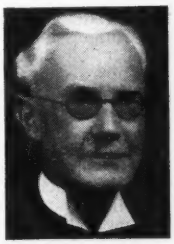
IN the various plans which have been put forward for the reorganisation of the electricity supply industry there seems to be only one feature common to all: it is that the Electricity Commission should be retained and even strengthened in its personnel and powers. While no doubt the supply industry itself is generally well acquainted with the constitution and activities of the Commission it seems that many outside this section are not so familiar with the subject and it may therefore be of service to them to be told something about the Commission and its work.



Practically from its inception the electricity supply industry has been subject to regulation, the earliest measures for the purpose being the Acts of 1882 and 1888. For the first thirty-seven years administrative and technical control was exercised by the Board of Trade which gave its name to the metered unit of electricity. On the financial side, so far as municipal authorities were concerned, control of borrowing was divided between the Local Government Board (which was later merged in a new Ministry of Health), the Secretary for Scotland and the London County Council.



The 1919 Electricity (Supply) Act put an end to this separation of physical and financial functions by creating an Electricity Commission to which these powers and duties with regard to borrowing were transferred. At the same time the Board of Trade was relieved of the whole of its responsibilities, these being transferred to the Minister of Transport who was empowered to exercise the transferred powers and duties through the Commissioners. Later the electricity functions of the Minister of Transport were transferred to the Board of Trade and finally to the new Minister of Fuel and Power.



Top: Sir John Kennedy (deputy-chairman) and Mr. C. G. Morley New. Centre: Sir Cyril Hurcomb (chairman). Bottom: Sir Leonard Pearce and Mr. R. T. G. French (secretary)

In establishing the Commission as a body "for promoting, regulating and supervising" electricity supply throughout the country, the premier place given to "promotion" indicated the new attitude of the Government towards the industry. This was further emphasised by the provision that of the Commissioners, who were to number not more than five, three should be selected for their practical commercial and scientific knowledge and wide business experience, including experience in electricity supply.

A certain measure of financial independence was ensured by making the industry itself responsible for the expenses of the Commission, though these have to be approved by the responsible Minister. The method adopted was to apportion these expenses among the six hundred or more undertakings in accordance with their output.

The original intentions which inspired the 1919 legislation were not fully implemented; in the Act as finally passed the proposed division of the country into districts controlled by District Boards was abandoned in favour of permissive schemes for Joint Electricity Authorities which did not progress very far. Parenthetically, it is as well to remember that the Commissioners still have power to set up Joint Electricity Authorities or similar bodies for specified districts. The Act also charged the Commissioners with the duty of securing a greater uniformity in systems of supply, which involved them subsequently in the great frequency change-over, which is now practically completed.

In spite of the, as some call it, "emasculation" of the 1919 Act, the Commission has exercised a very considerable influence upon electrical development in this country, an influence strengthened by subsequent Acts and Orders, which have also added considerably to its work.

For instance, the 1926 Electricity (Supply) Act, which set up the Central Electricity Board to effect the co-ordination of generation and main transmission of power, placed upon the Commission the task of preparing the general plan of the grid system and working out schemes for the regions into which the country was divided for the purpose. The schemes specify which stations are to be "selected" for grid purposes and the lay-out of the interconnecting lines.

Approval of Extensions

At the same time general supervision is exercised over all other extensions of power stations and distribution systems and where necessary inquiries are held by the Commissioners or their inspectors before sanction is given to the work and the expenditure involved. The supervision of borrowing which the Commissioners exercise over local authorities extends to the Joint Electricity Authorities, whose stock regulations are made by the Commissioners, and the Central Electricity Board.

Special Orders authorising the supply of electricity, the compulsory acquisition of land for generating stations and substations, etc., are also made by the Commissioners, such Orders being subject to confirmation by the responsible Minister and to approval by Parliament. The exercise of rights of purchase by local authorities and the terms of transfer of stations and undertakings are subject to the Commissioners' approval, as are arrangements between electricity undertakers for mutual assistance and bulk supplies. Differences between undertakers regarding the price to be paid for indirect bulk supplies from the grid are determined by the Commissioners.

The Commissioners also approve types of meters and testing apparatus and appoint meter examiners under the Electricity Meters Act of 1936. In this direction they have issued a useful memorandum upon the re-use of meter jewels and pivots.

Special attention has been given to rural electrification, and, under the Commissioners' ægis, demonstration schemes have been running for some years at Bedford and Norwich, and the Commissioners have taken considerable interest in a number of other schemes, both by companies and local authorities, in all parts of the country. The Commissioners' annual reports up to the outbreak of war have given information regarding the progress of many of these schemes. This branch of the work was initiated by a conference of interested bodies convened in 1927. The conference published a report in 1928 and remained in being as an advisory body for some years. The encouragement and assistance given to supply undertakings has brought about a large measure of rural development that would have not materialised otherwise—or at any rate would have taken many more years to achieve.

Not the least important part of the Commissioners' activities has been the collection and collation of statistics and information which have been published annually (up to the outbreak of war) in the form of an annual report and "Engineering and Financial Statistics." It is believed that the competition engendered between power station owners as a result of the classification of stations in order of thermal efficiency has had much to do with the great improvement in operation.

Other matters with which the Commissioners are concerned include the prescription of forms of accounts; certain questions arising in connection with claims for compensation for loss or worsening of employment due to the working of the Electricity (Supply) Acts; scales of depreciation of plant; the breaking up of streets for cables; new systems and changes of systems of supply; and regulations which have included the general "safety" regulations of 1937 and the Overhead Line Regulations of 1931.

Before the war all this work was carried out with a staff of 142 (91 established) and at an annual cost of about £70,000, representing 0·00089d. per kWh sold by authorised undertakings.

Wartime Activities

Since the war began the many duties of the Commissioners have been added to in a number of miscellaneous directions until they now seem to be the guides, philosophers and friends of all supply undertakings in most matters arising in the course of their operations.

They are the "competent authority" for the purposes of all kinds of wartime measures, such as the Civil Defence Act and the War Damage Act (Section 70). To mention but a few examples: they authorise the acquisition of steel, timber and other materials required by electricity undertakings; they supervise fire-guard and works fire brigade arrangements in electricity undertakings; they are concerned with man-power in the supply industry; they assist the Ministry of Labour and National Service to secure technical personnel for the Forces; they give (or withhold) approval to building and civil engineering works by undertakings; they advise on the protection

of power plant and the restoration of supplies; and they issue directions for the securing of economy in fuel and materials.

At present the Commission consists of a chairman, two whole-time Commissioners and one part-time Commissioner. The chairman is Sir Cyril Hurcomb, an experienced civil servant who, in addition, is Director-General of the Ministry of War Transport. Sir John Kennedy (deputy-chairman) and Mr. C. G. Morley New, the whole-time Commissioners, and Sir Leonard Pearce (part-time) are all men of very considerable experience in electricity supply and are very well known to all in the electrical industry. The Secretary is Mr. R. T. G. French, C.B.E., who has been with the Commission since its establishment in 1920.

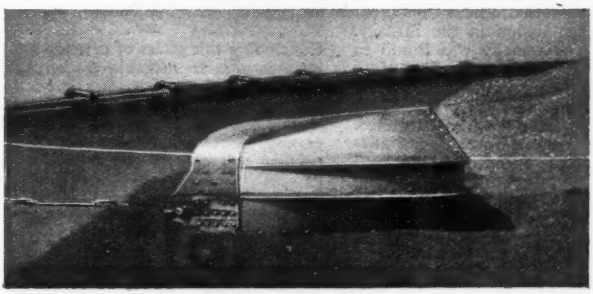
Coal Storage

Guarding Against Deterioration and Combustion

IN order to ensure a sufficient supply of coal at generating stations to meet all contingencies, it has been the normal practice to hold a reserve that would meet about three months' needs. In view of the space this would occupy (up to 50 cu. ft. is required per ton) the vertical dimension of the coal becomes a major consideration, the limit to the depth of coal practicable being determined by the risks of deterioration through the heating or spontaneous combustion that may occur, usually within the first six to twelve weeks of stocking.

Ample ventilation will dissipate heat but is difficult to achieve except in the smallest heaps. Air that has uncontrolled ingress to the body of the coal starts and supports heating. In a recent publication of the Fuel Research Organisation, it is pointed out that coals of mixed sizes are liable to this trouble because the larger pieces open the texture of the heap thus admitting air. Dropping of coal from a height should therefore be avoided so as to avoid breakage of the pieces. Packing the coal tightly, *e.g.*, by rolling while the heap is being built up, is recommended.

Horizontal stratification of coal in the first instance would, therefore, appear to reduce heating risks materially. This can be carried out by the use of a drag scraper by which coal is stacked in layers, each of which is compressed by the rolling action of the bucket on its return journey. The bottomless steel-plate scraper bucket employed in the Sauerman system, introduced by Mr. E. F. Sargeant into this country (where it has been installed at power stations for storage capacities of up to 90,000 tons) is the effective component of the plant, which also comprises a winch of 300 HP in the largest size (though units down to 30-HP are also available), a headpost and fairlead and either a tail car or, as in more recent installations, an elevated monorail which can be carried on a retaining wall or on stiff-leg struts; by this means it is possible to shift the tail blocks frequently by small amounts. It is claimed that air pockets are so effectively sealed that no case of spontaneous combustion has been recorded where coal has been stocked by the employment of a drag scraper.



The Sauerman drag scraper equipment

I.E.E. President's Appeal

THE President of the Institution of Electrical Engineers (Col. Sir A. Stanley Angwin), in making the annual appeal for contributions to the Benevolent Fund, points out that if a small regular subscription were guaranteed by every member in 1943-44 the income (which has shown a welcome increase in the last few years) would top all previous records and provide a fund worthy of the Institution. He therefore makes a special appeal to the many who do not already subscribe to share the responsibility of providing timely assistance to any member or his dependants needing help. The President's thanks are extended to all who have generously contributed in the past.

Boiler Reliability

Maintenance, Operation and Availability

By V. Smith, B.Sc.Tech.

IN a previous article (November 12th issue) attention was called to the importance of choosing boiler auxiliaries, especially fans, that are adequate in capacity for the stipulated evaporation. A convention to establish standards of design was suggested with perhaps a panel of experts to determine a basis for performance data, capacities and margins.

Another aspect of the influence of auxiliaries is afforded by the effect upon availability of combustion conditions. It was precisely the attainment of good combustion conditions by the introduction of turbulent burners and other devices which, fifteen to twenty years ago, first produced slagging troubles in the United States, when the intense heat thus created brought about ash fusion in the furnace. The remedy was found in larger furnaces and more water cooling, plus the adoption, in many cases, of the slag-tap furnace. Now, however, given adequate furnace volume and cooling surfaces, slagging may be caused by inefficient combustion conditions.

Concluding this series of articles on measures to increase boiler availability, the author says that the task is one calling for the systematic efforts of all concerned — contractors, undertakings and central authorities

Such conditions may be due to poor pulverisation, to imperfect mixing with the combustion air or to a burner position which does not make full use of the furnace volume for thorough mixing to ensure complete combustion. Coarse pulverisation results in incomplete combustion of the coal particles, which form large slag deposits, frequently in the base of the furnace. With stoker-fired boilers improper appliances and operation can similarly cause slagging, and possible remedies have already been suggested. The aim is rapid and complete combustion as far away as possible from the point of possible slag deposition, *i.e.* the tubes screening the gas exit, the zone of intense heat being brought near the centre of the furnace.

Air-Heater Choking

The third manner in which auxiliaries affect availability is in the frequent choking of certain units, notably air heaters, and on this point responsibility appears to be equally shared between design and operation. The air heater bears the brunt of any untoward conditions in the boiler, for inefficient combustion is frequently reflected in the rapid choking of the preheater. Even, however, should conditions be otherwise good, preheater troubles are by no means uncommon, and are almost invariably due to low exit-gas temperatures causing moisture deposition, choking and corrosion. This may be due to low design temperatures, or to the operator's failure to by-pass the air heater at low loads, starting up or shutting down or during soot blowing. On the other hand, choking and corrosion may be taking place unknown to the operator or before he has had time to remedy the situation.

A direct remedy lies in designing for a higher chimney temperature. In the United States there appears to be a tendency to work at from 300 to 350 deg. F. with resulting loss of efficiency. A well-found boiler of 300,000 lb. per hour evaporation operating with a chimney temperature of 250 deg. and a chimney CO_2 of 12 per cent. would have an efficiency of, say, 86 per cent., but for a chimney temperature of 350 deg., other conditions being equal, the efficiency would fall to about 83 per cent. Using 14,000 BThU coal the consumption in the first case, for a particular set of steam and feed conditions, might be 30,600 lb. per hr. and in the second 31,800 lb. This gives an increased consumption of over ½ ton per hr. or say, 3,000 to 4,000 tons per annum for a single boiler. Before increased availability is sought at such a price, alternative means of preventing the choking of preheaters, whilst yet preserving reasonably low chimney temperatures, should be investigated.

Carefully-Planned Overhauls

Arrangements for the easy and frequent cleaning of air heater surfaces should be considered. There is a tendency in some power stations to continue running until the choking of some auxiliary causes an involuntary shut-down. A carefully planned system of overhauls might wholly obviate this situation. Cleaning at regular intervals would cut down "outage" times very considerably, for light deposits can be easily washed away, whereas badly choked auxiliaries must be rodded and cleaned mechanically.

Rotary air heaters may now be so arranged that the elements can be either cleaned or replaced with the boiler in operation, the gases continuing to flow through the gas passages while the rotor is stationary. The casing is so arranged that one section of the

rotor may be washed at a time without interference with either the air or gas passages. To achieve this, doors are arranged on either side of the rotor between the gas and air ducts, the doors being actually fitted in the main beam, which is splayed out to accommodate them. When in the closed position these doors form a part of the heater sealing surface. Alternatively, the elements may be quickly removed and replaced by a clean set without disturbing the sealing arrangements. A complete preheater may thus be dealt with in a few hours, the boiler meanwhile operating at a slightly reduced efficiency due to the loss of preheated air from one unit.

Economy and Renewal Costs

Even with regular cleaning every few weeks, preheater plates, when operating at low temperatures, may gradually corrode, but the cost of replacements after, say, two to three years' running may prove to be small in relation to the higher efficiencies obtained. A comparison of costs would seek to establish the optimum point, balancing the cost of air-heater plate renewals against higher fuel costs, also bearing in mind that the present-day need for fuel economy may well continue for all time. With the system of cleaning advocated, even lower chimney temperatures may be worked to, thus reaching boiler efficiencies not previously considered practicable.

Economisers should not require frequent cleaning, but sometimes heavy deposits make a shut-down necessary. It is not impossible so to arrange the boiler layout that the economiser may also be by-passed on the gas side, to enable it to be cleaned with the boiler in operation. This necessitates gas dampers before and after the unit, as well as a by-pass damper to short-circuit the gases directly from the boiler into the air heater. The arrangement is not easy to carry out and necessitates good constructional work to ensure reasonably gas-tight dampers.

The Operational Factor

Much of the outage time of boilers is due to operational deficiencies, lack of knowledge or experience and failure of the human element, quite apart from that due to unavoidable accidents. In fairly recent cases within my knowledge, loss of feed has wrecked the furnace water walls of five large boilers in three separate plants, causing shut-downs of at least six months' duration in each case and a total repair bill of some £10,000, in addition to consequent loss of generating plant output. In two cases motor-driven feed pumps tripped out and in the third a leaking gauge gave a false water-level reading. The usual safeguards existed, including high-low alarms and steam-driven stand-by feed pumps with automatic starting devices, yet these failed to protect the boilers, for reasons which remain obscure, but which might have been avoided had the staffs been properly trained to deal with such emergencies.

Many failures occur due to the neglect of most elementary rules by operators who are insufficiently trained, having regard to the nature of their responsibilities in looking after plant involving heavy capital expenditure and fuel and maintenance costs.

In order to improve matters the following minimum steps seem to be necessary:—(1) The preparation of a national code of boiler operation. This should be, not a mere list of rules, but a comprehensive manual on thoroughly practical lines dealing with modern steam boiler plants in all their details and covering all phases of operation and maintenance. (2) Training in the actual handling of boilers, including the principles governing the attainment of maximum efficiency, drill in starting up and shutting down and the measures necessary in an emergency, particularly in the case of feed-system failures, which result in more accidents than all other causes put together. (3) Complete sets of written operating instructions should be available for every plant, giving full particulars of all parts and auxiliaries, with drawings and illustrations. A large industrial firm recently prepared operating instructions for its new boilers running to eighty pages.

Operating staffs would, in the vast majority of cases, respond wholeheartedly to such an attempt nationally to place boiler operation on a high level of intelligence and skill. The old attitude of indifference is very largely responsible for the troubles which are being experienced to-day.

Boiler Cleaning Methods

Notwithstanding the suggestion made earlier that a more liberal basis of design might eliminate most of the prevalent troubles, the vast majority of boiler plants must be taken as they are, and methods devised to keep them in service as long as possible.

Water lancing has recently been applied to many boilers, and an inquiry into its efficacy was advocated in this journal on July 30th by Mr. J. A. Sumner. Apparently the desirability or otherwise of the practice has yet to be established, and the result of such an investigation would be of great interest. In this connection the following editorial comments in the American magazine *Combustion* for February, 1943, are of interest as reflecting United States opinion:—

> "Water lancing has been practised by some companies in this country for several years, although opinion among operators is divided as to its advisability, many preferring steam or air for this purpose. Un-

questionably, water will remove slag accumulations, but it must be applied with discretion and proper supervision, lest damage be incurred. It is most important that the jet be kept in motion and that impingement on headers and hangers be avoided.

"Should the jet be kept in contact with the tube for a brief period after the slag has become detached and fallen off, the water will cause some drop in the temperature of the tube; and as soon as the jet is removed, the temperature of the tube will rise rapidly to a value much higher than when it was covered with slag. The resulting contraction and expansion, particularly in the case of straight tubes, is likely to cause loosening of the joints in the header, the position of which is fixed by the adjacent tubes. Attempts, in some cases, to water-lance superheaters have been disastrous, and should be discouraged.

"It is suggested, therefore, that British engineers keep these possibilities in mind and exercise necessary precautions and strict control where adopting this method of deslagging. The wide application of water lancing to industrial plants, as advocated editorially by one magazine, would seem highly questionable as many such plants lack the necessary expert supervision. . . ."

Use of Oil Burners

An alternative method of cleaning furnace heating surfaces is suggested by the fact that certain boilers can be cleared of slag by reducing the amount of air to the furnace, thus increasing the CO_2 content and the furnace temperature, causing the slag to melt and run into the base of the furnace. A similar effect is produced in some boilers which burn both coal and oil. The provision of auxiliary oil burners might therefore offer a suitable means of clearing furnaces of slag accumulations. Oil burners could be installed in the furnace wall near the region of slag accumulation and would be brought into play for a few minutes, say once per shift. The resulting temporary and local increase in furnace temperature should be sufficient to melt the slag and would avoid the chilling effect of the water lance. In a p.f. fired unit these burners could be used for starting up the boiler and they would also be available for emergency use and for keeping up the evaporation with poor coal.

In fact, oil burners offer a very satisfactory method of increasing availability of plants which otherwise fail to reach the desired output. When employed for fusing slag deposits the combustion of coal might be temporarily slowed down to avoid increasing the evaporation unduly, although no difficulty should be experienced for the short time the burners would be in operation. The oil flame need not impinge on the slag, since the zone of increased temperature should be sufficient to effect its removal. Many existing boilers, including some of the most recent installations, possess oil burners, and experiments on the above lines should not be difficult to carry out.

This and the preceding articles do not purport to be more than a general commentary on a problem calling for close and systematic study. Whilst primarily directed towards increasing the availability of existing boiler plants during the present emergency, the successful solution of the problem will go a good deal further than this in raising the efficiency of power generation and substantially reducing operating costs, a result out of all proportion to the cost of the necessary investigations.

In the past there has been too much secrecy and lack of co-operation between the different interests. This was forcibly brought out by Mr. Sumner in the article mentioned earlier, where he refers to the more enlightened spirit prevailing, in particular to the activities of the Edison Electric Institute, whose Prime Movers' Committee issues frequent reports on all phases of steam generation.

The primary object is to ensure that boiler availability shall equal that of the turbine, in order to reap the advantages of the one-boiler/one-turbine plant. Many of the causes of past failures to achieve this end would seem to be avoidable. Slagging can be greatly reduced, if not entirely eliminated, by proper design, chiefly by building larger furnaces, water-cooled to the right degree, by efficient combustion appliances, by isolating and cleaning auxiliaries with the boiler in service and by other measures that would reveal themselves in the course of detailed investigation. The next step is to ensure that the plant is controlled by a well-trained staff who thoroughly understand their job and who are keen to get the highest possible efficiency and reliability from the units under their care.

Availability is not an isolated problem, but is closely wrapped up in all phases of power station practice—design, construction and operation—and its solution can hardly be sought piecemeal, but is a task calling for the systematic efforts of all concerned—contractors, undertakings and central authorities. Given this co-ordinated teamwork it can hardly be doubted that the problem of boiler outages will be reduced to a fraction of its former dimensions.

Railway Signalling

ANY risk of a track circuit being wrongly shown as "clear," owing to the sticking of a relay armature, is obviated when energy is supplied as a train of impulses forming a code with a corresponding synchronised predetermined following code at the other end of the circuit. The self-proving system of the Westinghouse Brake & Signal Co. is described in a new booklet of 44 pages and 25 line diagrams explaining in detail the various applications of coded track circuits.

PERSONAL and SOCIAL

News of Men and Women of the Industry

THE Staff Committee of Fulham Borough Council has recommended that the sum of £10,000 shall be paid to the borough electrical engineer, **Mr. W. C. Parker,** and certain of his assistants for extra overtime duties.

In November, 1938, Mr. Parker was appointed engineer for a project, with the assistance of S. H. White & Son for the civil engineering work, and by this arrangement there was a saving of over £40,000 in engineering fees. The Committee recommends that for this work, subject to the approval of the central authorities, a sum of £5,000 shall be paid as follows :—Mr. Parker, £2,500; Mr. H. Clarke, former chief generating engineer, £1,500; Mr. H. Gleave, operating superintendent, £390; Mr. J. Y. Hutchinson, technical superintendent, £390; Miss E. E. Lee, personal secretary, £145 and Mr. F. la T. Budgett, £75.

It is proposed that a similar total sum of £5,000 shall be paid for further services. Mr. Parker would receive £3,750 in five yearly instalments of £750, and the balance of £1,250 would be divided in five yearly aggregate amounts of £250 among Messrs. J. Y. Hutchinson, P. Scott (efficiency superintendent), H. Gleave, F. la T. Budgett, T. Gray (architectural assistant) and Miss Lee according to the work performed.

Mr. S. C. Harling, deputy city electrical engineer of Chester, has been appointed borough electrical engineer of Leigh, Lancs.

Mr. Harling, who is only thirty-eight, served his apprenticeship with Harrogate Corporation Electricity Department and rose to the position of distribution superintendent and acting deputy electrical engineer. In 1941 he was chosen from eighty-five applicants for the Chester appointment. He is an associate member of the Institution of Electrical Engineers and an associate of the Institution of Mechanical Engineers. He has contributed articles to the *Electrical Review* on maintaining supply under war conditions, and tariff standardisation. His hobby is model engineering and he obtained several diplomas for his exhibits at model engineering exhibitions in London in pre-war days.

The Earl of Airlie, K.T., chairman of the North of Scotland Hydro-Electric Board, read the lessons at a recent church service at Edinburgh for the Scottish electrical industry. A collection was taken for the Electrical Industries Benevolent Association. Leading representatives of the electrical business community attended the service.

Sir Samuel Strang Steel, Bt., has been appointed a director of the Scottish Power Co., Ltd., to fill the vacancy created by the death of Mr. Kenneth Sanderson, W.S.

Hackney Borough Council Establishment Committee has recently had under consideration the grading of **Mr. F. Meadows,** assistant substation superintendent, and **Mr. J. Parker,** assistant substation engineer. At present their salary is in accordance with Grade 9 (£354/£361/£370), with the addition of £13 in the case of Mr. Meadows. When approached, the District Joint Board expressed the view that they should be placed in Grade 8a (Class H) of the scale (£401/£413/£423), and the committee has recommended that they shall be transferred as from January 1st next.

Mr. W. Barham, construction engineer with the Hackney Electricity Department, is retiring next year after thirty-five years' service with the Council.

Mr. H. J. Harper, senior assistant mains engineer in the Hackney undertaking, has been appointed an assistant mechanical and electrical engineer with the Air Ministry.

Inverness Town Council has confirmed the appointment of **Mr. Neil B. Macarthur** as engineer and manager of the Electricity Department in succession to the late Mr. G. C. McLean.

Mr. N. B. Macarthur

Mr. Macarthur, who is forty-five, was born at Gorthleck, Inverness - shire. He was educated at the Royal Technical College, Glasgow, and Glasgow University, and received three years' practical training with the British Thomson-Houston Co., Ltd. at Rugby. In 1922 he obtained an appointment with the Dundee Corporation Electricity Department as junior charge engineer, and he has been with the same undertaking ever since. During the past twenty-one years he has held the posts of senior charge engineer, turbine and switchgear maintenance engineer, technical assistant (generation) and—since 1939—senior technical assistant. He is an associate member of the Institution of Electrical Engineers and holds the B.Sc. degree (electrical and mechanical engineering of Glasgow University) and the Diploma in Electrical Engineering of the Royal Technical College, Glasgow.

In reporting the appointment of **Mr. T. Scott** as sole representative for Scotland for C. H. Parsons, Ltd., we should have stated, to avoid possible confusion, that this referred to the manufacturers of "Britmac" electrical accessories.

Mr. V. Smith, B.Sc.Tech., author of the article on "Boiler Reliability," has had considerable experience in the development of plant of this description for power station extensions in his capacity as engineer, Boiler Department, with Simon-Carves, Ltd. He served an engineering apprenticeship with Hick, Hargreaves & Co., Ltd., and in 1923 was appointed assistant to the head of the Condenser Department of John Musgrave & Sons, Ltd. After obtaining a Manchester "Armaments" scholarship he took a three-year course in mechanical engineering at the College of Technology, Manchester. Subsequently he joined the staff of Henry Simon, Ltd., as draughtsman in the

Conveying Department, and in 1929 he obtained an appointment with the Renold & Coventry Chain Co., Ltd., as engineer dealing with the application of chain drives, mechanical power transmission appliances, conveyors, etc. He left the Renold Co. in 1937 to take up his present post.

Mr. H. A. Sharples, public lighting superintendent, Blackpool, was due to retire under the age limit next January, but his services are to be retained for another year.

Mr. W. J. Terry, chairman and managing director of the London Electric Wire Co. and Smiths, Ltd., and managing director of the Liverpool Electric Cable Co., Ltd., has been re-elected chairman of the Cable Makers' Association.

Sir Harold Flannery, Bt., M.B.E., has been appointed a director of Callender's Trust, Ltd.

Mr. L. Winpenny has been appointed instructor in electric arc welding at Sunderland Technical College.

Obituary

Mr. D. G. Sumner.—We regret to announce the sudden death, due to heart failure, on December 5th, of Mr. D. G. Sumner, manager of the Manchester branch of the Reliance Telephone Co., Ltd. (a subsidiary of the G.E.C.). Mr. Sumner was one of the pioneers of telephony and was responsible for some of the largest private telephone installations in this country and abroad, among others the first telephone network in Persia to be installed for the Anglo-Persian Oil Co.

Mr. J. H. Roberts.—The death occurred at Wanstead, Essex, on December 15th, at the age of fifty-two, of Mr. John Hamilton Roberts, who had been secretary of the Cable Research Committee since its inception in September, 1927; he was also secretary of United Telephone Cables, Ltd., and Power Holdings, Ltd. He commenced his business career with W. T. Henley's Telegraph Works Co., Ltd., in 1905, and after experience in the Accountant's Department, obtained rapid promotion and was appointed company accountant at the age of twenty-eight.

Mr. C. F. Fawdry.—The death occurred on Dec. 19th, after a short illness, of Mr. Charles Frederick Fawdry, a director of Speedy & Eynon, Ltd., electrical installation contractors. He was sixty-three years of age.

Alderman James Hewitt, J.P., chairman of the St. Helens Corporation Electricity Committee, died on December 11th in his seventieth year. He was elected a member of the Committee in 1921 and appointed chairman in 1923, which appointment he held until the time of his death. He was mayor of the town in 1931.

Will.—Sir William Guy Granet, a director of Associated Electrical Industries, Ltd., left £54,360 (net personalty £44,446).

Egham Lighting Contract

Lords Decide in Council's Favour

As reported in the *Electrical Review* of December 3rd (p. 734) the House of Lords recently reserved judgment in the dispute between the Egham & Staines Electricity Co., Ltd., and the Egham Urban District Council.

The judgment was delivered on December 15th when the Lords dismissed the appeal by the company against a decision of the Court of Appeal reversing a judgment of Mr. Justice Cassels that the company should be paid a sum of £3,590 by the Council under a public lighting contract, notwithstanding that the streets had not been lighted because of the "black-out."

Lord Russell of Killowen said that the contract included a clause that no default should render the company liable in damages if that default arose from any unavoidable cause over which the company had no control but that payments should abate in the same proportion as the supply should be curtailed. On the issue of the Lighting Restriction Orders the company ceased to light any of the street lamps and in fact took steps which prevented any possibility of the lamps being lighted by the removal of either time-switches or fuses.

The Council contended that that curtailment was by reason of an event provided for in the *force majeure* clause and that curtailment being total in respect of the lighting the abatement of payment for supply for that purpose was total also.

His Lordship said that he agreed with the Court of Appeal that the proviso in the *force majeure* clause applied, that the supply had been entirely extinguished by reason of an event provided for in the clause and that as a result the obligation of the Council to make payments had come to an end.

It had been contended by counsel before their Lordships that the supply had not been in fact curtailed because the current had been supplied up to the point of its entry into the lamps, that that was the supply which was contracted for and was referred to in the *force majeure* clause and that no default had occurred within the meaning of the clause. He was unable to accept that contention. The contract was not merely to supply energy up to a point short of the lamps and leave it there but to bring it there and at stated times to cause it to proceed to light the lamps. The contract was for a supply for lighting the lamps; it was not a contract to supply merely electrical energy, but a contract to supply electric lighting.

The curtailment of the supply had taken place by reason of the Lighting Restriction Orders, an unavoidable cause over which the company had no control. Since the curtailment was such that the supply ceased *in toto* the proportionate abatement must result in the complete exoneration of the Council from liability to pay until the supply was renewed.

Viscount Sankey and Lords Thankerton, Macmillan and Wright concurred and the appeal was accordingly dismissed with costs.

CORRESPONDENCE

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for correspondents' opinions.

House-Wiring Schemes

SOME ten years ago, in an endeavour to standardise and improve plug outlets, we adopted the flat-pin plug system. On the publication of the 10th edition of the I.E.E. Regulations we met the local contractors and agreed upon certain modifications for use in this supply authority area. I have therefore been very interested in the correspondence recently published in the technical Press on the comparative merits of flat-pin and round-pin plugs.

One writer stated that "in a voltage drop test across the pin contacts, flat-pin plugs gave some higher readings than did the round pin." I was so concerned by this statement that I took samples at random from my stock and tested them for millivolt drop when carrying full load. The round-pin plugs and sockets were those known as high quality having sprung contacts, complying with B.S.S. 546. Care was taken that the voltage drop measured was across the pin contacts only. The results showed that at full load the voltage drop across the round-pin type was three to four times as great as that across the flat-pin type. The flat-pin plug was one of a well-known make and these tests have proved to me its superior efficiency of contact.

It seems to me that the voltage drop with either type of plug was not very serious, but I have satisfied myself on this question, as it appeared to me in our early choice of the flat-pin plug that at least the contact efficiency would be no worse that that of the round-pin plug, and our choice was made because of the "convenience" factor of the flat-pin plug.

Nelson. T. D. MARTIN, A.M.I.E.E.,
Engineer and Manager.

MR. ATHERTON, in your issue of December 3rd, states that the superiority of the round-pin plug and socket is conclusively proved; it therefore seems rather curious that we continue to utilise flat contacts for switches, fuses, and practically all other contacts *except* plugs and sockets. The adoption of flat pins is advocated not because of comparison in current-carrying capacity between the types—one is probably as good as the other—but purely on the basis of consumer-convenience.

Other correspondents have suggested that all types of flexible cables can be adequately protected by means of a 10-A fuse, and if short-circuits were the only faults likely to be encountered I should be inclined to agree. With portable apparatus, however, the possibility of earth faults has also to be taken into account, and with the ever-present possibility of resistance in the earth circuit, over-fusing may make all the difference between safe isolation of the faulty appliance —or flexible—and dangerous maintenance of a lethal voltage on the equipment.

I am of the opinion that a fusing factor of 1·6 for small fuses is unduly optimistic; my experience is that with fuses of 10-A rating and less a fusing factor of 2 to 2·5 is more likely, and this should be taken into account. Protection against fire and shock demands that protective fuses should be maintained at the lowest possible level, and that where a 5-A fuse is large enough a 10-A fuse should never be used. For this reason I am in favour of the retention of three sizes of fused plugs—2, 5 and 10 or 15-A—with one size of socket. Would Mr. Ryder advocate a 10-A fuse for protecting an electric clock?

Cambridge. T. C. GILBERT.

Prices of Second-hand Plant

IT seems to me unlikely that the result achieved by price control of second-hand electrical equipment would justify such Government action as is apprehended by Mr. W. E. Lawton in your issue of December 10th. It would surely be an added complication to the very involved regulations now in force. If there are isolated cases suggestive of profiteering, such as the example quoted by Mr. Lawton, the purchasers always have a remedy if it suits them to apply it.

There are other reasons, however, for high prices and in disregarding them price control may defeat the very object it sets out to achieve. The cost of suiting a particular inquiry with second-hand equipment must be weighed against the cost of material and labour in producing new equipment to serve the same purpose. In comparing these costs the saving in production time should be computed in terms of cash saving, and this may well prove to weigh decisively against new equipment under war conditions.

In pricing second-hand electrical equipment the contractor may start as a basis upon the stock value of the equipment which he possesses or upon the cost to him if he has to purchase in order to re-sell. According to circumstances there may be several intermediate parties involved in the conveyance of such equipment, each of which requires due recompense, to which must be added modification costs, carriage, etc. The final cost may be more than that

of new equipment to serve the same purpose but time and raw materials have been saved.

The user of the equipment will not always appreciate why the cost of second-hand equipment is in some cases so high, and he would do well to make inquiries, as the explanation may be sound on the grounds of national economy. National economy at the expense of electrical equipment users is another matter and outside my present scope. Prices can be reduced by simplifying the means whereby redundant electrical equipment can be harnessed to the national war effort.

Wembley, Middx. E. H. CROOK.

I MUST express some surprise at the letter which you published on December 10th, from Mr. W. E. Lawton, dealing with the prices of second-hand plant. I feel sure that most readers will be aware of the General Price Control Order applying to second-hand goods, in which it appears that no second-hand article can be sold at a higher price than the relative price for a new article.

As I have recently been consulted in connection with the legal difficulties facing the used machinery trade in wartime I feel that it ought to be clearly stated that the dealer who sells machines at a price nearly 100 per cent. above the present-day manufacturers' price, is running a very considerable risk and it would also seem strange that the purchaser should be prepared to pay such an excessive amount.

In any profession or business there are always exceptions to the standard of integrity expected, and it is all to the good that any incidents of this nature should be brought to light. I would like to suggest, however, that the proper method of dealing with an offence of this kind is to lay it before the appropriate trade association and not to ventilate it in a journal which is read by thousands of buyers of the goods in question, thereby affecting the confidence of buyers in the trade generally.

Hapton, Nr. Burnley. J. V. BRITTAIN.

Electrical Fires

THE views expressed by Dr. S. F. Barclay in the *Electrical Review* of October 22nd on the subject of the protection of fire service personnel who are called upon to deal with electrical fires are both timely and instructive and call for little, if any, criticism. His four simple rules are sound and doubtlessly comprehensive but, at the same time, require a fairly intimate knowledge of the layout of electrical plant and lines in and around the building concerned.

During severe air raids and in the case of serious fires, fire service personnel are often drafted at short notice to towns and cities to which they are comparative strangers and they are called upon to exercise a high degree of initiative and resource in their major duty, the extinction of fires. In these circumstances, their knowledge of the location of dangerous electrical plant is likely to be negligible and they must carry out their work in complete ignorance of the possible dangers from this source. In any case, it is reasonable to say that, to the uninitiated, the terms "Low Voltage," "High Voltage" and "E.H.T." mean little more than can be summed up in one word "Danger," and to ask fire fighting personnel to differentiate on a seemingly minor point—minor, compared with many fires—and then to choose a "safe" place from which to attack a fire tends to limit their often already limited choice of such strategic positions.

It seems, therefore, that if the men holding the branch pipe can be protected irrespective of the circumstances in which they work and, at the same time, not be called upon to give attention to things other than their primary duty, that of fighting the fire, an appreciable step forward will have been taken, not to mention the psychological effect on the firemen possessed of the knowledge that, under all conditions, they are protected from electric shock.

One means of achieving this condition is to provide with every fire fighting unit a number of suits consisting of rubber gloves with a flexible metal palm connected to metal soled boots. The connection between the gloves and boots could be provided in a convenient manner by a flexible conductor incorporated in the sleeve and body of the tunic and in the legs of the trousers. The suit, when worn, could thus be made electrically continuous between the palm of the glove and earth and, by this means, any current passing down the jet of water to the branch pipe would be shunted to earth without passing through the fireman's body.

Harrogate, Yorks. P. B. FROST.

Coal Supplies

YOUR issue of December 3rd reports that in answer to a question at a meeting of Hull Electricity Committee, I stated that I had refused to accept a delivery of coal and that it was sent back. This, I fear, is an error of reporting. The circumstances I reported were that a parcel of a certain coal was offered by Coal Control to the Department. Our experience of this coal was that it was most unsuitable for our plant. It was, therefore, declined and was not shipped.

There are many difficulties on all sides in relation to coal supplies, and these are, of course, common to everybody, but it is undesirable at the present time to introduce controversy or further to add to existing difficulties.

Hull. D. BELLAMY,
General Manager.

[Our information was derived from a local newspaper.—*Editors, Electrical Review.*]

COMMERCE and INDUSTRY

Relations with Australia. Companies' Training Schemes.

Increased Price

WE remind readers that as from the first issue of the New Year the price of the *Electrical Review* is to be raised to 9d. As we stated in our original announcement, the increase has been necessitated by the rising cost of production of the journal.

Fuel Economy Broadcast

After the 8 o'clock news on Monday, Michael Standing of the B.B.C. spoke from the control room of a large London power station. It was the time of the morning peak and after a brief picture of the control arrangements, attention was drawn to the frequency meter pointer which, Mr. Standing said, was endeavouring to struggle from 49·9 to 50 cycles. The voice of a control engineer picking up load was heard; it was explained that as the output was stepped up more fuel was needed; listeners were directed to the coal conveyor and then the hum of the generators was heard.

Consumers were asked at this point to switch off every lamp and appliance which was not really needed. This, it was said, brought up the frequency to 49·999 and the amount of fuel which could be saved in this way in the course of a week was stressed. It was claimed that this knocked 40,000 kw off the peak of the stations feeding into the grid, equivalent to a saving of 5,250 tons of coal a week.

Repair of Rubber Boots

A pamphlet (R.R.B./1a) has been issued by the Board of Trade describing the facilities available for the repair and reconditioning of rubber boots belonging to "essential" users. If the repairs cannot be carried out locally the wearer (or his employers) must obtain a permit from a sponsoring authority—in the case of the electricity supply industry the Electricity Commissioners. The boots should then be taken to the retailer from whom they were obtained who will decide whether they are repairable or not. If they are he will send them to the reconditioners who will reject or repair them as they think fit. The pamphlet contains a list of reconditioning firms. It also gives a number of hints upon the care and preservation of rubber boots.

Australia and Britain

The Canberra correspondent of *The Times* has cabled extracts from an article by Mr. Chifley, the Australian Treasurer and Minister of Reconstruction, in which trade relationships between the Commonwealth and Great Britain are discussed.

In the course of this Mr. Chifley says that the war has helped Australia to undreamed of development of her secondary industry, notably in engineering and textiles, which will be competitive with that of the United Kingdom; yet she will need to regain these overseas markets for her primary products, of which the United Kingdom has long been the mainstay. If she is to do so she must sympathetically and fruitfully consider those post-war problems of the United Kingdom arising directly from the Mother Country's unprecedented sacrifices. The reinforcement of Britain's strength, so depleted by her sacrifices in the common cause, is thus a policy of enlightened self-interest even should it demand from Australia the surrender of what may seem immediate advantage. This is not to suggest that Australia should be expected to abandon any industry that is soundly based and vital to her healthy growth; but in her own interests she will need to see that uneconomic enterprises which have arisen under the abnormal conditions of war-time are outrooted and means of procuring two-way trade evolved.

Should Australia be faced by claims for economic concessions from the United States, whose aid in the South-West Pacific campaign may be regarded as giving American *entrepreneurs* some special title to consideration, she may well reply that while she is deeply conscious of this debt and means to discharge it to the limit of her ability, her first obligation is to minister to the well-being of Great Britain because that is essential to the survival of the British Commonwealth—which is no less fundamental to that Anglo-American accord which, be it functional or organic, all thoughtful Australians regard as the hope of the post-war world.

Polyvinyl Chloride Compounds

Since the loss of our rubber supplies to the Japanese, the electric cable-making industry has saved large quantities of rubber by substituting polyvinyl chloride coverings. It is calculated that these savings already amount to some thousands of tons a year.

Owing to this increasing use of p.v.c. compounds for cable-making purposes, there has arisen a heavy demand for certain compounding ingredients, and it is therefore necessary to exercise the most stringent control over their use.

To achieve this, the Plastics Control and the Cable Planning Organisation of the Ministry of Supply have decided to standardise polyvinyl chloride compounds for general and specialised cable manufacture as from December 15th. The advantages of this scheme will be twofold; first, the reservation of essential materials, and second, a guarantee to purchasers that polyvinyl chloride cables to any specification will be made from compounds of the standard required regardless of the source of manufacture.

Occupational Training

In addition to the comprehensive scheme for training students and post-graduate apprentices which is conducted at the Chelmsford works of Crompton Parkinson, Ltd., the company has undertaken the provision of facilities for the training and part-time education of all youths who enter its service. To secure the co-operation of parents the company has outlined the arrangements in a booklet entitled "Occupational Training for Engineering Production." In an introductory letter Mr. Frank

Parkinson emphasises that success in the future will depend more than ever before on the thoroughness of the training every boy receives for his chosen career.

The scheme is divided into two groups, training and amenities. In addition to works training, educational classes of a comprehensive nature are conducted at the Mid-Essex Technical College, jointly by the company and the college authorities. Up to the age of sixteen the pupils are instructed on a general education curriculum, and they are then transferred to engineering training in one of four main classes, namely: mechanical, electrical, clerical and draughtsmanship. The four-year course (14-18) covers such subjects as general and engineering science, workshop practice, electricity and magnetism, and structure of industry. The scheme may be extended above the age of eighteen for those who desire to continue training and elect to sit for a qualifying examination.

J. & P. Apprenticeship Scheme

Details of the Johnson & Phillips scheme of apprenticeship training in engineering are given in publication G.1 (2nd edition, revised January, 1944). The company's trade apprenticeship scheme, for which all employees between the ages of fourteen and eighteen are eligible, has been in operation for some years. No indentures are entered into and no fees are payable. Recently it has been decided to widen the basis of the scheme to ensure that maximum attention is given to the employees both in the factory and the training institution.

There are three grades of apprentices, namely, junior trade (three to four years' course), senior trade (three years) and engineering apprentices (two to three years). Junior trade apprentices receive preparatory tuition at the Woolwich Day Continuation School and the senior grade attend Woolwich Polytechnic on one whole day a week. No tuition fees are payable up to the age of twenty-one and the company pays the apprentices' wages for the day that they attend the classes. Outstanding employees are selected to take a "sandwich" course of instruction in electrical or mechanical engineering which leads to the B.Sc. degree in engineering. Such engineering apprentices are given the privilege of gaining experience on the distribution systems of the company's subsidiary electricity supply undertakings. For each work period they are paid the normal wage. If living in the L.C.C. area they are eligible for a scholarship with a subsistence allowance of 30s. a week (at present) for the Polytechnic period. Those living outside the L.C.C. area must themselves pay the Polytechnic fee (£10 per annum for the course plus £13 out-of-county fee) and they are not eligible for the subsistence allowance.

Cable Factory Lighting

Thorn Electrical Industries, Ltd., have sent us particulars of an installation at a cable works recently carried out by them. The entire load (200 points totalling 126 kW) had to be balanced over the three-phase supply and provision made for t.p. and n. section fuse boards. The cross sectional area of the sub-main cable was chosen not to exceed a voltage drop of 3·5 V under maximum load conditions. Cable sizes from fuse boards were chosen to give a voltage drop not exceeding 2 V under maximum load conditions and control was effected by means of ironclad switches grouped at the fuse boards. "Atlas" 1,000-W gasfilled lamps in concentrating detachable top reflectors were mounted at a height of 33 ft. in a symmetrical system, avoiding as far as possible the necessity for local lighting, and a uniform surface illumination of 10 ft.-candles was obtained. The lighting units (concentrating and dispersive reflectors arranged at 25 ft by 30 ft. centres) were suspended from the roof trusses in such a way as to prevent premature lamp failure through vibration from travelling cranes. To ensure high overall efficiency the walls were sprayed in a light colour up to the crane rails, giving improved illumination up to as much as 20 per cent.

In the rubber shop, to facilitate cleaning and maintenance, lowering and raising gear is fitted. This has a special engaging device to ensure positive contact when the units are raised. The maintenance and carpenters' shops are fitted with detachable top dispersive reflectors with supplementary illumination from 24-V local lighting units on the machines and benches.

Contract Price Adjustment Formulæ

The British Electrical and Allied Manufacturers' Association informs us that the latest figures for use in its contract price adjustment formulæ are as follows:—(*a*) "Rates of Pay."—The rate of pay for adult male labour at December 11th shall be deemed to be 86s. 6d. (no change); (*b*) "Costs of Material."—The index figure for intermediate products last published by the Board of Trade on December 11th is 172·5 and is the figure for the month of November. For October the figure was 172·3.

Contravention of Control Order

At Old Street Police Court, London, last week, Maison Mazza, Ltd., of Wilson Street, London, E.C., were fined £275 for supplying controlled goods manufactured by them—water immersion heaters—between December, 1942, and April, 1943, contrary to the Electrical Appliances (Control of Manufacture and Supply) Order. They were also fined £125 for a similar offence between April and June this year and ordered to pay 30 guineas costs. The Magistrate, Mr. Rowland Thomas, K.C., said it was quite clear that there was nothing nefarious about the transactions.

Mr. J. C. Marshall, prosecuting, said that the article concerned, the "Flasheet" water heater was a device by which water in a china or metal jug could be electrically heated. It was sold for domestic use. Mr. Mazza was told at the Board of Trade that he could not have a licence, not only because of the porcelain, rubber and china used in its manufacture, but because the heater was itself a dangerous article. The two electric points which heated the water stuck out of the appliance, and the danger of receiving a shock would be increased after the heater had been immersed. Mr. Marshall contended that the "Flasheet" heater was a dangerous article and should not be on the market.

Mr. M. Levene, defending, said that the firm had £4,000 worth of articles in stock, and

a letter from the Board of Trade led them to assume that they could dispose of them. A letter they sent was not seen by the Board for some months, and the firm assumed, since they received no reply, that they could continue to supply the heaters.

The Magistrate said that the total profit, which appeared to be about £350, must be part of the penalty.

Bathroom Fatalities

Mrs. Anne Charlotte Porter (50), of New Malden, was killed in her bath when she touched a portable electric fire and at the Kingston inquest a verdict of "Accidental death" was recorded. Her husband, Mr. W. J. Porter, stated that the power plugs in the house were out of order, so his son joined two pieces of wire together and the plug was put into the light socket. An electrician explained to the Coroner that as the result of the way in which the wires had been joined, and the type of plug used, the framework of the electric fire became alive.

At an inquest at Scarborough on Flight-Sergeant Albert Meehan, who received a fatal shock in his bath, it was stated that he had been "experimenting" with an electric fire. He was found with his feet in the bath water and his left hand holding an electric fire, which was of the single-bar type. A two-pin connection was used to the bathroom light. Mrs. Meehan said that recently their baby had recovered from whooping cough and her husband remarked that he would try out the electric fire, which they had never used before, in order that they might put it in the child's bedroom. One morning she heard him say "I'll try this" and saw him half way up the stairs carrying a flex lead from the wireless set. Later she heard him shout. A verdict of "Death by misadventure" was recorded.

Changes of Address

Compound Electro Metals, Ltd., have now resumed occupation of their West End offices at 42, Pall Mall, S.W. (telephone: Abbey 1939).

Cunningham Electrical & Radio, Ltd., have moved to 272, Kensington High Street, London, W.8. The telephone number is unchanged (Western 2805).

Fluorescent Lighting

In very many of the new wartime factories the lighting installations comprise arrangements using the 80-W 5-ft. fluorescent tube and the demand for the limited supply of these lamps has necessitated the imposition of a licensing system by S.R. & O. 1943 No. 1201. It is therefore incumbent upon users to make the best of them and the Electric Lamp Manufacturers' Association has assisted this aim by producing a card which enables users to diagnose causes of trouble and then to apply the relevant remedies.

It is pointed out that symptoms indicating that a lamp has reached the end of its useful life are blinking, probably with a shimmering effect; low light output, with dark rings or patches along the length of the tube and particularly near the cap; or a slow pronounced flicker. A lamp which shows no sign of "life" may not have failed; the fault may be in another part of the circuit. Possible switch faults are dealt with and users are warned never to try a good lamp in a circuit until it has been established that the lighting circuit itself is not defective.

Leaflet 5A contains a good deal of useful information upon the wartime applications of fluorescent lamps, giving notes upon design and details of the characteristics of the tubes. These publications are obtainable gratis from the E.L.M.A. Lighting Service Bureau, 2, Savoy Hill, W.C.2.

TRADE MARK APPLICATIONS

RECENT applications for British trade marks include the following, objections against which may be entered within a month of December 15th:—

METVIC. No. 625,533, Class 1. Resinous condensation products, resinous polymerisation products, casein-plastics, cellulose-plastics (other than cellulose nitrate-plastics) and liquid, plastic or solid materials formed thereof or therewith, all for industrial purposes and none being paints, lacquers, varnishes or of the nature of rubber. To be associated with No. 401,999 (2247) i and others. No. 625,534, Class 6. Unwrought and partly wrought common metals and their alloys, and goods (not included in other classes) made therefrom. To be associated with No. 428,500 (2332) v and others. No. 625,538, Class 11. Apparatus and installations for lighting, heating and ventilating and parts thereof not included in other classes. To be associated with No. 401,998 (2208) xviii and others. No. 625,539, Class 12. Land vehicles, aircraft, water craft, and parts (not included in other classes). To be associated with No. 396,424 (2184) vi and others. No. 625,540, Class 17. Electrical insulation materials and electrical insulation parts made therefrom; gutta percha, india-rubber, balata, synthetic rubber, mica and articles (not included in other classes) made therefrom. To be associated with No. 401,999 and others. No. 625,541, Class 19. Non-metallic preparations, substances and materials, for use in building, decoration and construction (none being in the nature of paint). To be associated with No. 401,998 and others.—Metropolitan-Vickers Electrical Co., Ltd., 1, Kingsway, London, W.C.2.

INFORMATION DEPARTMENT

GENERAL inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by our Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

Our extensive records enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the following:—

KELVIN NORTON clip-on inspection lamp fittings.

Workmen's Compensation

Provisions of the Temporary Increases Act

By F. E. Sugden,
A.C.I.S., Barrister-at-Law

ON November 11th, there was passed a statute to increase temporarily the supplementary allowances payable to workmen entitled to weekly payments by way of compensation under the Workmen's Compensation Act, 1925, and the compensation payable under that Act on the death of workmen. I do not think it necessary to give in this article a summary of the 1925 Act or full details of the Workmen's Compensation (Supplementary Allowances) Act, 1940; it will be sufficient to indicate for the benefit of readers the changes brought about by the new statute, the Workmen's Compensation (Temporary Increases) Act, 1943.

At the outset I may say that the new Act came into effect on November 29th and continues in force until December 31st, 1946.

Previously the compensation payable in respect of children of a male workman who were under 15 years of age, was at the rate of three to four shillings per week in respect of each child; the amount has now been increased to five shillings per week. A further supplementary allowance of five shillings per week per child is payable during the first thirteen weeks of the employee's incapacity and after that period the amount payable is ten shillings per week. If the employee has his wife living with him he is also entitled to receive five shillings per week as a supplementary allowance for the first thirteen weeks and thereafter ten shillings per week. The payment in respect of children may be extended above the age of 15, where they are receiving full-time instruction at a school. The payment is not payable after the child has ceased to receive full-time instruction at a school, or after the 31st day of July after the child attains the age of 16 years, whichever is the earlier date.

Limitation of Allowance

There is a limitation to this supplementary allowance. A weekly sum of compensation plus a supplementary allowance must not exceed two-thirds of the average weekly earnings of the workman before his accident in the case of total incapacity.

The method of ascertaining what the weekly earnings are is laid down in the Act of 1925. In the case of partial incapacity the amount payable shall not exceed two-thirds of the difference between the amount of the average weekly earnings of the workman before the accident and the average weekly amount which he is earning, or is able to earn, in some suitable employment or business after the accident.

The present proposals also have regard to allowances payable for war injuries and the amount must be brought up to a benefit of forty shillings per week. Further in the case of long-term cases in which incapacity exceeds thirteen weeks, the Act gives additional allowances bringing the single man up to a maximum of forty shillings and the married man up to fifty shillings.

There is also an increase in the maximum payments in fatal cases. Previously the maximum payments were £200 or £300 according to the circumstances of the case; these maxima have now been increased to £300 and £400 respectively. Where a widow has been left with children the amount payable has been raised from £600 to £700. The £200 benefit was based on the period during which the man was actually employed.

The limitation of the operation of the Act to 1946, means that before the expiry of the Act there must be a review of the circumstances and a revision of the terms.

Review of Payments

This Act does not alter the procedure for the review and redemption of payments; the employee is still compelled to submit himself to a medical examination at the hands of the employer's doctor, subject, of course, to the provisions of the Workmen's Compensation Acts, 1925-1940. These Acts provide (*a*) that a man may only be required to be examined at reasonable hours, and (*b*) that, after one month has elapsed from the date of the award or first payment of compensation, he need not submit to examination oftener than as follows: Once a week during the second month, once a month during the third, fourth, fifth and sixth months and afterwards once in every two months. An employer who has commenced proceedings for a review of the weekly payment is allowed one additional examination.

If the employer thinks that the workman has completely or partially recovered, he may at any time, in default of agreement with the workman, apply to a County Court Judge, or other arbitrator to stop the weekly payments or reduce their amount. Similarly a workman, if his disablement increases, may apply for an increase.

PARLIAMENTARY NEWS

By Our Special Reporter

More Wireless Sets

REPLYING to a question by Mr. Liddall in the House of Commons on December 16th Capt. Waterhouse, Parliamentary Secretary to the Board of Trade, said that some 70,000 wireless sets of British make were approaching completion in this country. They were being released through normal trade channels at prices regulated under the Prices of Goods Act, 1939. In addition, about 14,000 sets of American manufacture bought in the United States for civilian use had now reached this country, but only a small proportion were as yet ready for distribution. It was intended that these sets should be distributed through trade channels, and the distributors' remuneration was now being negotiated.

Electric Pumps on Farms

Mrs. Wright asked the Minister of Agriculture whether he favoured the provision of electrically driven pumps to farms; and whether his Ministry had any information on the best types of electric pumps available.

Mr. R. S. Hudson said that the question whether electricity was the most suitable motive power for any particular pumping plant depended on the circumstances, but the electrically driven pump had the advantage that it could be automatically controlled. The work to be done determined the best type of pump to be used, but his Department did not undertake to advise individuals on this matter.

Mrs. Wright asked if the Minister was not aware that farmers needed guidance and help in this technical matter. Would he see that a proper survey was made and give some advice?

Mr. Hudson replied that the farmer could apply to his local War Agricultural Committee; they would put him in touch with the local electricity suppliers, who were the best people to advise him.

Rural Services

Sir Percy Hurd asked the Minister of Health whether the development plans now being submitted by rural district councils included the completion of water and sewerage services in rural parishes in all appropriate cases; whether adequate Treasury grants would be continued; and whether provision was also to be made for cheap electricity in rural parishes generally for domestic and agricultural uses.

Mr. Willink said that if Sir Percy Hurd had in mind the short-term housing programmes now being submitted by rural district councils, the possibility of providing water, sewerage and other services was borne in mind in selecting the site. Public services would be provided for the new houses wherever such services were reasonably available. He had recently notified the authorities that he was prepared to examine proposals for urgently needed post-war schemes for water supply and sewerage and sewage disposal. In reply to the second part of the question, the Government recognised the special difficulties as regards piped water and sewerage in rural areas, and would consider sympathetically at the appropriate stage whether it was possible in suitable cases to ease the financial burden of the capital cost of schemes for sizeable groups of houses. The third part of the question should be addressed to the Minister of Fuel and Power.

Sir P. Hurd asked the Minister of Health if he would urge on the Minister of Fuel and Power the imperative necessity for having cheap electricity in rural areas.

Mr. Willink said he would consider the point.

Licensing Retailers

Replying to questions in the House of Commons last week Mr. Dalton, President of the Board of Trade, said that the present system of licensing retailers was an essential part of wartime control. It would not, however, be possible to bring it to an end with the cessation of hostilities in Europe, and the present arrangements for licensing shops, whether those selling food or those covered by the Location of Retail Businesses Order, would have to continue for some time during the transition period. But it was not intended that these arrangements should be permanent.

So long as licensing continued it would be operated so as to facilitate the return to their former businesses of persons on the Board of Trade Register of Withdrawing Retail Traders.

Ex-Service men on the Register would have priority, and, disabled persons, including but not wholly including ex-Service men, who were not in retail trade before the war would have an opportunity of entering. It would not be desirable, however, for too many disabled ex-Service men with no previous experience of retail trade to push in, as they did after the last war, with very unfortunate results.

High-pressure Steam Plant

IT is reported by *Reuter's Trade Service* from New York that a new American steam plant, employing a pressure of 2,500 lb. per sq. in. at a temperature of 940 deg., was recently described to the American Society of Mechanical Engineers. The first reports of its performance show that it is exceeding all previous records in efficiency in generating electricity by steam. The plant belongs to the Indiana & Michigan Electric Co. at Mishawaka, Ind. Design began six years ago and the first operation started in 1941; changes were then made. Final operation began in March this year. The performance reports were made by Mr. Philip Sporn, vice-president and chief engineer of the American Gas & Electric Service Corporation and Mr. E. G. Bailey, vice-president of the Babcock & Wilcox Co., both of New York City. The highest steam pressure previously recorded in America was 1,800 lb.

The plant is claimed to be the most efficient power unit in the country. Its efficiency in converting coal to useful heat is 34 per cent. The previous record figure was 32·3 per cent. The capacity of the unit is 76,500 kW.

ELECTRICITY SUPPLY

Yarmouth Finances. Worthing Studies Reconstruction.

Barrow - in - Furness.—FARM WORKERS' COTTAGES.—The Electricity Committee has had an application for the provision of a supply to ten agricultural cottages at Cartmel, Gleaston, Scales and Urswick. The Electricity Commissioners are being approached with regard to the matter.

LOAN.—Application is being made for sanction to borrow £3,000 for mains and services.

Cheltenham.—OVERHEAD LINES.—The Electricity Committee has obtained sanction to erect overhead lines.

Croydon.—REFRIGERATORS FOR CANTEENS.—The Education Committee reports that the Board of Education has agreed to the purchase of refrigerators for school canteens providing over 150 meals daily. Application is to be made for 27 refrigerators at a total cost of £2,665.

Fort William.—UNNOTIFIED APPLIANCES.—The Town Council at its last meeting considered a report by the electrical engineer pointing out that consumption of electricity was approaching dangerously near the maximum. He had paid visits to premises of consumers and made a list of appliances installed without consent of the Council. He cited several cases where heavily-loaded cookers, etc., had been fitted into lighting sockets, which constituted a grave danger and in the case of unauthorised installations he had made the appliances inoperable.

The Council took a serious view of the question although it was pointed out that many cases of hardship might be involved owing to the cutting out of these appliances. Many people had to go out during the night and owing to the difficulty of getting extra coal, etc., electrical appliances were the only means of preparing a meal. It was decided the Electricity Committee should go into the whole matter and report to the next meeting of the Council.

Gateshead. — KITCHEN EQUIPMENT. — The Town Council is to spend £397 on the installation of electric cookers and boilers at the Bensham Hospital. The cost includes £250 for electric cable.

Glasgow.—ABOLITION OF MINIMUM CHARGE.—On the recommendation of the general manager, Mr. George Morgan, the Electricity Committee has decided to abolish the minimum charge for the duration of the war. Mr. Morgan considers that, on balance, there is little to gain by retaining the minimum at the new point (10s), the small loss incurred thereby being likely to be recovered, for the most part, by a consequent reduction in administrative costs.

Great Yarmouth.—UNECONOMIC CHARGES.—Discussing the annual electricity accounts at a recent meeting of the Town Council, Mr. H. S. Matthes, vice-chairman of the Electricity Committee, stated that for a considerable time they had been selling electricity at a loss. The difference between revenue and expenditure had been met by drawing on the substantial funds put by before the war, but those funds were now on the point of exhaustion. The Committee was to meet to consider what action should be taken. Whether it would have to advance the price remained to be seen, but it had been the considered policy of the Council of selling its products too cheaply that had led to the adverse position.

Lichfield.—LOAN.—The Electricity Committee is seeking sanction to borrow £12,903 for the bulk supply scheme.

Liskeard.—WIRING COUNCIL HOUSES.—The Rural District Council has approved a recommendation of its Housing Committee instructing the clerk to prepare a scheme for the wiring of those houses where a supply of electricity is likely to be available.

Markinch (Fife).—ARRANGEMENTS FOR POST-WAR LIGHTING.—When the Town Council at its last meeting discussed post-war street lighting it was pointed out that the Fife Power Co. was not in a position to guarantee installation until some time after the cessation of hostilities. It was suggested that the Council should enter into an agreement with the local gas company providing it did not exceed three years. One member, advocating delay, said that he would not support any proposal for street lighting by gas. Further consideration was postponed.

Worthing.—POST-WAR RECONSTRUCTION.—In October last a resolution passed by the Town Council on the subject of post-war reconstruction in relation to the electricity supply industry was sent to Earl Winterton, who is M.P. for the Division. In his reply, which was read at the December meeting of the Council, Earl Winterton stated that there had been no indication that the Government was in the process of suggesting any changes in the law governing the supply of electricity. A recent reply by the Prime Minister had seemed to indicate that no proposals for a widespread change in the function of local government — which would, of course, include changes affecting electricity supply—were likely to be made within the lifetime of the present Government.

Alderman W. G. Tree, having informed the Council that the Post-War Reconstruction Committee was awaiting a pronouncement by the Government before presenting a report, added that he " thought this would be possible at the January meeting."

TRANSPORT

Argentina. — TRAMWAY CONTROL. — The Government of the province of Tucuman has decided to bring under provincial control the tramway services of Tucuman city, which have a capital of one million pesos. Trams now running have a board attached to them reading, " This coach is Argentine."—*Reuter.*

Bournemouth.—POWER SUPPLY.—The Transport Committee has expressed the view that in the present circumstances and having regard to the technical considerations involved, it is

impracticable to take from the Bournemouth & Poole Electricity Supply Co., Ltd., all the electrical energy required, and further, that a proper use has been made of the two sources of supply available. The matter will, however, be kept under review and the manager is to submit periodical statements of the quantities of electricity generated at the Council's station and the quantities purchased from the company together with the costs involved.

Glasgow.—RAILWAY ELECTRIFICATION AND DISTRICT HEATING.—Electrification of railways and district heating of houses were advocated by Mr. E. R. L. Fitzpayne, general manager of Glasgow Corporation Transport Department, in an address to the Town and Country Planning Association. In the cities, he said, there should be a system of high-speed light railways or tramways on those roads suitable for them, aided where necessary by the use of tunnels, linked up with trolley-bus services on roads too narrow for tramways. For the lightest traffic there should be petrol or oil buses.

Mr. Fitzpayne remarked that the building of modern flats lent itself to the adoption of district heating, which was a matter of interest to transport and electricity authorities as a means of using beneficially the waste heat from the power stations. Mr. Donald Smith, who had pioneered district heating in this country, pointed out recently that in the Cowcaddens area of Glasgow at least 5,000 houses were consuming 10,000 to 15,000 tons of coal per year, and that if these houses were rebuilt in the same area they could be supplied with hot water from the Pinkston power station at a fraction of the present cost of coal to the occupiers.

Manchester.—EXTENSION OF TIME.—The Corporation is seeking an Order for the extension for three years of the time for the commencement of the running of trolley vehicles in Stretford.

New Zealand.—RECORD TRAM TRAFFIC.—The *New Zealand Electrical Journal* reports that tram traffic increased by 16 per cent. in 1942-43, due to war conditions. The total number of passenger-journeys was 200·7 million, compared with the previous year's record of 172·9 million.

FINANCIAL SECTION

Company News. Stock Exchange Activities.

Reports and Dividends

Crompton Parkinson, Ltd., held their annual meeting on December 17th, when Mr. Frank Parkinson, who presided, reviewed the accounts and referred to the increased cash bonus. He repeated that the board regarded 15 per cent. as the normal dividend on the ordinary and "A" ordinary stock and that the bonus would be varied if necessary year by year so as to reflect the fluctuating earning capacity of the company. The board were fully alive to the necessity for preparing to meet the post-war situation. They were constantly striving to establish higher efficiencies and production methods while maintaining and improving their standards of quality and design. The total production had reached a new high record this year.

E. K. Cole, Ltd., announce that the trading profit for the year to September 30th was £263,401 (against £188,179). The net profit rose from £70,400 to £82,093. After meeting depreciation, taxation, etc., and transferring £50,000 to general reserve, paying a participating dividend of 3 per cent. (same) on the preferred ordinary shares and 15 per cent. (against 10 per cent.) on the ordinary shares, £13,738 is carried forward. The output is reported to have been the highest on record. While manufacturing interests have expanded they have remained within the basic field of pre-war production. A controlling interest in Ensign Lamps, Ltd., has been acquired and the share holding in Scophony, Ltd., has been sold. To meet future capital requirements it is proposed to create 1,000,000 further ordinary 5s. shares and to convert the preference, preferred ordinary and ordinary shares into stock.

Ensign Lamps, Ltd., shows a profit of £45,807 for the year to June 30th last (against £50,415 for 1941-42). General reserve receives £8,000 (against nil) and a final dividend of 5 per cent makes 15 per cent. for the year (against 25 per cent.). Reference is made to the acquisition of the control of the company by E. K. Cole, Ltd., and it is stated that the board has been reconstituted. The contribution to reserve, although it reduces the dividend, is said to be necessary for strengthening the company's post-war position.

The capital of Ensign Lamps, Ltd., consists of 300,000 ordinary shares of 5s. each.

Marco Refrigerators, Ltd.—In the course of his speech at the annual meeting on December 16th, Mr. R. A. Fulford (chairman) referred to the great amount of work in hand with promise of further expansion. Earlier in the war their activities were mainly concerned with vital war necessities, but it soon became obvious that refrigerators and allied manufactures were almost as vital as any other commodity and they had turned out a very large volume of that class of goods.

They looked forward to the future with confidence. Their post-war programme was well defined and their plant and improved methods should be capable of meeting the anticipated large demand.

Crystalate, Ltd.—At the annual general meeting on December 15th, Sir Herbert E. Morgan (chairman), said that they were now preparing a scheme for the reconstruction of the company's capital. The recommendation would be made that the "assets deficiencies" account should be eliminated. Subject to its being placed on a proper capital basis he regarded the prospects of the company as good. They were engaged in an industry which was on the up-grade and for whose products he foresaw a continued demand in the post-war period.

Bullers, Ltd.—The net profit for the year ended July 31st last was £23,984 (against

£27,956). After meeting debenture redemption, preference dividend, etc., and maintaining the ordinary dividend at 7½ per cent., a balance of £26,577 (against £20,828) is carried forward.

Heenan & Froude, Ltd., held their annual general meeting last week. Mr. Alan P. Good (chairman) said that the works of the company and its subsidiaries had been fully extended during the year and the productive capacity had been fully employed throughout. As production had been mainly of the company's leading peacetime specialities the transition stage at the close of hostilities would not cause undue hardship or concern.

The General Cable Manufacturing Co., Ltd., is paying a final dividend of 9 per cent., again making 15 per cent. for the year.

The Globe Telegraph & Trust Co., Ltd., is to pay a quarterly dividend of 1 per cent. tax free (same).

Broom & Wade, Ltd., have declared a final dividend of 15 per cent., again making 22½ per cent. for the year.

Telephone Rentals, Ltd., are paying an interim dividend of 4 per cent. (same).

Pernambuco Tramways & Power Co., Ltd., reports an operating revenue for 1942 of £601,099, as compared with £557,641 for 1941. The net result was a loss of £2,242, as compared with a profit of £9,496 in the previous year. The deficit at the end of the year, after allowing for profit on exchange, was increased from £119,756 to £121,816.

New Companies

McEwan King Refrigerators, Ltd.—Private company. Registered December 9th. Capital, £10,000. Objects: To carry on the business of refrigeration, cold storage, electrical, gas and general engineers, etc. Directors: J. McEwan King, 1477, Dumbarton Road, Glasgow, W.4 and W. B. Haddow, 66, Sherbrooke Avenue, Glasgow, S.1. Solicitors: Davis & Davis, 42, Gracechurch Street, London, E.C.3. Registered office: 1-2, Churton Street, S.W.1.

Electronic Controls, Ltd.—Private company. Registered December 8th. Capital, £10.0 Objects: To carry on the business of designers, manufacturers and exploiters of electronic apparatus for the control of engineering equipment, especially automatic precision control of furnaces, heat-treatment, steel-works, metal-working and woodworking plant, moulding processes, machine tools, cranes, lifts, hoists, stage lighting, floodlighting, food-processing and dehydration, etc. Directors: D. F. Campbell, St. Mary's House, Oatlands Drive, Weybridge; W. S. Gifford, The Maples, Broadwater Close, Walton-on-Thames; and G. E. Taylor, Colcroft, Grimwade Avenue, Addiscombe, Croydon. Registered Office: 17, Victoria Street, London, S.W.1.

Electrical and Radio Engineers (Golders Green), Ltd.—Private company. Registered December 4th. Capital, £100. Objects: To carry on the business of electrical, radio and television engineers, etc. T. S. Rey, 903, Finchley Road, Golders Green, N.W.11, is the first director. Registered office: 903, Finchley Road, Golders Green, N.W.11.

Deebles (Falmouth) 1943, Ltd.—Private company. Registered December 9th. Capital, £1,000. Objects: To carry on the business of electricians, manufacturers of, and dealers in, batteries, dynamos, accumulators, wireless and television sets and electrical goods, etc. Directors: F. E. Deeble and Mrs. Marion Deeble, both of Tregarthen, Daniell Road, Truro. Solicitors: Nalder & Sons, Truro.

Companies' Returns

Statements of Capital

Witton-James, Ltd.—Capital, £6,100 in 2,000 6 per cent. cumulative preference and 4,000 ordinary shares of £1 each and 2,000 deferred ordinary shares of 1s. each. Return dated August 19th. All shares taken up. £2,000 paid. £4,100 considered as paid. Mortgages and charges: £25,000.

Raydex Electric Heaters, Ltd.—Capital, £2,000 in £1 shares. Return dated September 1st. 2 shares taken up. £2 paid. Mortgages and charges: Nil.

Increases of Capital

Fusarc Welding Co., Ltd.—The nominal capital has been increased by the addition of £10,000 in 10,000 unclassified shares of £1 each, beyond the registered capital of £10,000.

Clear Hooters, Ltd.—The nominal capital has been increased by the addition of £1,500 beyond the registered capital of £6,500. The additional capital is divided into 1,500 participating ordinary shares of £1 each.

Curtis Manufacturing Co., Ltd.—The nominal capital has been increased by the addition of £2,000 in £1 ordinary shares beyond the registered capital of £6,000.

Grundy & Partners, Ltd.—The nominal capita has been increased by the addition of £2,200 in £1 ordinary shares beyond the registered capital of £300.

Armand Taylor & Co., Ltd.—The nominal capital has been increased by the addition of £1,300 in £1 ordinary shares beyond the registered capital of £700.

Mortgages and Charges

Quartz Crystal Co., Ltd.—Debenture, charged on the company's property, present and future, including uncalled capital, dated November 29th, 1943, to secure £250. Holder: W. J. Thompson, 3, Waverley Avenue, Surbiton.

B. & H. (Nottingham), Ltd.—Satisfaction in full on October 21st, 1943, of mortgage dated June 16th, and registered June 18th, 1943, securing all moneys due or to become due from the company to Westminster Bank, Ltd.

Receiver Released

R. & W. (Electrical), Ltd.—Walter J. Green, C.A., of 17, Bedford Row, W.C.1, ceased to act as receiver and/or manager on November 25th, 1943.

Bankruptcy

W. Price and A. Greenburgh, electricians, trading as W. Price & Co., 29, Russell Street, Plymouth. Last day for receiving proofs, December 30th, 1943. Trustee, Mr. A. N. F. Goodman, 1, Church Lane, Tavistock, Devon.

STOCKS AND SHARES

TUESDAY EVENING.

CHRISTMAS week is seldom a lively time for business in the Stock Exchange. There have been notable exceptions in the past, but it is a long time since any Christmas week has been visited by activity in stocks and shares. The gilt-edged and pre-ordinary descriptions hold their ground with noticeable firmness, nor is there any decline worthy of the name in front-rank industrial companies' shares. Speculation has subsided from radio. Investment absorbs good stocks when they come to market, such, for example, as British Insulated, Henley's, Callender's and others of this type. The Stock Exchange closes at 2 o'clock on Christmas Eve. Members agree that the doors might just as well be closed at that time on the other business days which remain during the present year. The Prime Minister's illness had a noticeable effect in restraining enterprise. It caused a mild depression amongst prices: the effect, however, wore off in response to satisfactory bulletins.

Electricity Supply

The market for Home electricity supply shares goes steadily better. Hardly a week passes without its making a modest contribution to the improvement in prices. Far from shareholders in the industry regarding with any apprehension the post-war outlook for electricity supply, the confidence of the investor is rather, as prices show, confirmed in the security of his interest. No surprise would have been felt if the prices had re-acted to some extent upon publication of the power companies' plan which appeared at the end of last month. It was expected to have an unsettling effect upon the minds of proprietors of electricity supply shares. The course of prices has disproved this impression. Quotations as a whole have gained more ground. London Electric, London Associated and Metropolitans are better. Bournemouth & Poole, and Yorkshire are both up 6d.

Preference Shares

Another feature which stands out prominently in this section is the strength of the various preference shares. The £1 shares which carry 6 per cent. dividends are quoted at an average of 30s. or slightly over. At 30s. the yield on the money is, of course, 4 per cent., which seems slender, in view of the present cost of living (including Christmas presents) and the prices of commodities which are not controlled. Nevertheless, the market is constantly being caught out, as the Stock Exchange saying goes, of the best-class preference shares, the prices of which look more like advancing than reacting.

Edmundsons

Because the ordinary shares of Edmundsons Electricity Corporation pay £4 3s. 7d. per cent., or a shade more than some of the other good class electricity supply shares, they have been in considerable demand of late. Many thousand shares have been recently bought for investment pure and simple; there can hardly be any expectation that the dividend, 6 per cent. in each of the past five years, will be increased during the period of the war. After 1938, the capital was increased by 50 per cent. and the 9 per cent. dividend then being paid came down to 6 per cent.—relatively the same—on the increased capital. The company is a large holder of shares in subsidiary companies, one of the principal being Shropshire, Worcestershire & Staffordshire Electric Power. Coming after this, Wessex Electricity and South Wales Electric Power shares figure for large amounts in the Edmundsons' balance sheet. The accounts are made up annually to March 31st and submitted about May. An interim dividend of 2½ per cent. actual has recently been paid.

Price Fluctuations

Electric & Musical Industries at 26s. 6d. are ¼ lower; the price has now lost the rise it achieved upon the raising of the dividend. The meeting last week had no market effect. Pye deferred, on the other hand, are ¼ up, the assumption being that Pyes were unduly neglected in the recent enthusiasm for radio shares. Cossors are a few pence easier at 22s., and E. K. Cole at 25s. 6d. have fallen 1s. Laurence, Scott hardened to 13s., London Electric Wires to 33s. 6d.

In the equipment and manufacturing group, British Insulated are again ¼ better, at 5⅜. Murex rallied to the round £5. English Electrics at 47s. are 6d. to the good; so are General Electric ordinary at 88s. 6d. and the 6½ per cent. preference at 32s. Cable & Wireless ordinary is 10s. better at 76½. International "Tel. and Tel." have gone back 1½ to 14½ and Brazilian Tractions to 27. Tokyo Electric sixes have been marked down to 19.

Brakes and Signals

The price of Westinghouse Brake has again got out of step with that of Consolidated Signals. "Brakes" as they are called in the market, stand at 65s.; the equivalent at that price for Consolidated Signals should be £7 0s. 6d. The market price is 5⅜. At the present level, Westinghouse Brakes yield £3 17s. per cent., whereas Consolidated Signals pay £4 5s. per cent. The cost of exchanging from one into the other may be considered too much to make a "swap" worth while. But to anyone who is taking an

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ELECTRICAL INVESTMENTS

Prices, Dividends and Yields

Company	Dividend Previous	Dividend Last	Middle Price Dec. 21	Rise or Fall	Yield p.c. £ s. d.
Home Electricity Companies					
Bournemouth and Poole	12½	12½	61/6	+6d.	4 2 0
British Power and Light	6	7	32/–	..	4 7 6
City of London	7	7	28/–	..	5 0 0
Clyde Valley	8	8	40/6	..	3 19 0
County of London	8	8	40/6	..	3 19 0
Edmundsons:					
7% Pref.	7	7	33/6	..	4 3 7
Ord.	6	6	28/6	..	3 4 3
Elec.Dis.Yorkshire	9	9	44/–	..	4 1 10
Elec. Fin. and Securities	12½	12½	53/6	..	4 13 4
Elec. Supply Corporation	10	10	46/–	..	4 7 0
Isle of Thanet	Nil	Nil	18/–	..	—
Lancs. Light and Power	7½	7½	34/6	..	4 7 0
Llanelly Elec.	5½	6	25/–	..	4 16 0
Lond.Assoc.Electric	4	3	23/–	+6d.	2 12 4
London Electric	6	6	28/6	+1/–	4 4 3
LondonPowerRed. Deb.	5	5	103½	..	4 16 7
Metropolitan E.S.	8	8	40/6	+6d.	3 19 0
Midland Counties	8	8	39/–	..	4 2 1
Mid. Elec. Power	9	9	42/6	..	4 4 9
Newcastle Elec.	7	7	31/–	..	4 10 5
North Eastern Elec.:					
Ordinary	7	7	32/6	..	4 6 2
7% Pref.	7	7	34/6	..	4 1 2
Northampton	10	10	48/–	..	4 3 4
Notting Hill 6% Pref. (£10)	6	Nil	10	..	—
Northmet Power:					
Ordinary	7	7	37/6	..	3 14 8
6% Pref.	6	6	30/–	..	4 0 0
Richmond Elec.	6	6	26/–	..	4 12 4
Scottish Power	8	8	38/6	..	4 4 4
Southern Areas	5	5	22/6	..	4 9 0
South London	7	7	27/–	+6d.	5 3 8
West Devon	5	5	23/6	..	4 5 0
West Glos.	4½	3½	24/–	..	2 18 4
Yorkshire Elec.	8	8	42/6	+6d.	3 15 3
Overseas Electricity Companies					
Atlas Elec.	Nil	Nil	6/9	..	—
Calcutta Elec.	7*	6*	35/–	−6d.	3 8 8
Cawnpore Elec.	10	10	35/–	..	5 14 3
East African Power	7	7	33/–	..	4 4 10
Jerusalem Elec.	7	5	28/–	..	3 11 5
Kalgoorlie (10/–)	5	5	10/–	..	5 0 0
Madras Elec.	4*	Nil	23/–	..	—
Montreal Power	1½	1½	20½	−½	7 6 4
PalestineElec."A"	4*	5*	40/3	−9d.	2 9 10
Perak Hydro-elec.	6	7	10/–	..	—
Shawinigan Power	83cts.	90cts.	16	+½	—
Tokyo Elec. 6%	6	6	19	−1	—
VictoriaFallsPower	15	15	4⅞	..	3 9 7
Whitehall Inv.Pref.	—	—	24/–	..	4 3 4

Company	Dividend Previous	Dividend Last	Middle Price Dec. 21	Rise or Fall	Yield p.c. £ s. d.
Public Boards					
Central Electricity:					
1955–60 (Civil Defence)	–-	3	100	..	3 0 0
1955–75	5	5	114	..	4 7 9
1951–73	4½	4½	106	..	4 4 1
1963–93	3½	3½	102½	..	3 8 4
1974–94	3½	3½	99	..	3 6 8
LondonElec.Trans. Ltd.	2½	2½	97	..	2 11 3
London & Home Counties1955–75	4½	4½	111	..	4 1 1
Lond.Pass.Trans.:					
A	4½	4½	117½	..	3 16 7
B	5	5	118½	..	4 4 5
C	2⅞	3	65	..	4 12 4
WestMidlandsJ.E.A. 1948–68	5	5	109	..	4 11 9
Telegraph and Telephone					
Anglo-Am. Tel.:					
Pref.	6	6	115	..	5 4 4
Def.	1½	1½	28	..	5 7 1
Anglo-Portuguese	8	8	23/6	..	6 16 2
Cable & Wireless:					
5½ Pref.	5½	5½	113	..	4 17 4
Ord.	4	4	76½	+½	5 4 7
CanadianMarconi$1	Nil	4cts.	8/–	+6d.	—
Globe Tel. & Tel.:					
Ord.	8½*	5*	37/–	+1/–	2 14 0
Pref.	6	6	29/3	..	4 2 1
Great NorthernTel. (£10)	Nil	Nil	22½	..	—
Inter. Tel. & Tel.	Nil	Nil	14½	−1½	—
Marconi-Marine	7½	7½	32/3	..	4 13 0
Oriental Tel. Ord.	16	10	43/6	..	—
Telephone Props.	6	Nil	17/–	..	—
Tele.Rentals(5/–)	10	10	11/6	..	4 7 6
Traction and Transport					
Anglo-Arg.Trans.:					
First Pref. (£5)	Nil	Nil	3/–	..	—
4% Inc.	Nil	Nil	8½	..	—
Brit.Elec.Traction:					
Def. Ord.	45	45	1045	..	4 6 4
Pref. Ord.	8	8	175	..	4 11 5
Bristol Trams	10	10	52/–	..	3 17 0
Brazil Traction	$1	$1¼	27	−¾	6 9 8
Calcutta Trams.	5½	6½	35/–	−6d.	3 14 5
Cape Elec. Trams	5	6	24/–	..	5 0 0
Lancs. Transport	10	10	44/3	..	4 10 4
Mexican Light:					
1st Bonds	5	5	103½	..	4 16 7
Rio 5% Bonds	5	5	106½	..	4 14 0
Southern Rly.:					
5% Prefd.	5	5	76	−1	6 11 7
5% Pref.	5	5	116	..	4 6 2
T. Tilling	10	10	54/6	+1/–	3 13 3
West Riding	10	10	44/–	..	4 11 0

(*Continued on next page*)

* Dividends are paid free of Income Tax.

Company	Dividend Previous	Dividend Last	Middle Price Dec. 21	Rise or Fall	Yield p.c. £ s. d.
Equipment and Manufacturing					
Aron. Elec. Ord.	10	15	55/–	..	5 9 1
Assoc. Elec. :					
Ord.	10	10	49/–	..	4 1 8
Pref.	8	8	38/6xd	..	4 3 1
AutomaticTel.&Tel.	12½	12½	56/3	..	4 10 0
Babcock & Wilcox	11	11	47/6	..	4 12 5
British Aluminium	10	10	47/–	..	4 5 1
British Insul. Ord.	20	20	5¾	+¼	3 14 4
British Thermostat (5/–)	18½	18½	19/–	..	4 17 4
BritishVac.Cleaner (5/–)	15	30	26/6	..	5 13 5
Brush Ord. (5/–)	6	8	8/6	..	4 14 2
Burco (5/–)	15	17½	15/6	..	5 13 0
Callender's	15	20	98/–	..	4 1 8
ChlorideElec.Storage	15	15	80/–	..	3 15 0
Cole, E. K. (5/–)	10	15	25/6	−1/–	2 18 10
Consolidated Signal	17	24	5½	..	4 5 1
Cossor, A. C. (5/–)	7½*	10*	22/–	−3d.	2 5 6
Crabtree (10/–)	17½	17½	36/3	..	4 16 7
CromptonParkinson Ord. (5/–)	20	22½	27/–xd	+6d.	4 3 4
E.M.I. (10/–)	6	8	26/6	−¼	3 0 5
Elec.Construction	10	12½	50/–	..	5 0 0
Enfield Cable Ord.	12½	12½	59/6	..	4 4 8
English Electric.	10	10	47/–	+6d.	4 5 0
EnsignLamps(5/–)	25	15	20/–xd	..	3 15 0
Ericsson Tel. (5/–)	22*	20*	51/–	..	1 19 3
Ever Ready (5/–)	40	40	38/6	..	5 4 0
Falk Stadelmann	7½	7½	32/–	..	4 13 9
Ferranti Pref.	7	7	29/6	..	4 15 0
G.E.C. :					
Pref.	6½	6½	32/–	+6d.	4 1 3
Ord.	17½	17½	88/6	+6d.	3 19 2
Greenwood&Batley	15	15	41/3	..	7 5 9
HallTelephone(10/–)	12½	12½	25/–	..	5 0 0
Henley's (5/–)	20	20	25/–	..	4 0 0
4½% Pref.	4½	4½	23/–	..	3 18 3
Hopkinsons	15	17½	60/–	..	5 16 8
India Rubber Pref.	5½	5½	21/6	..	5 2 4
Intl. Combustion	30	30	6½	..	4 16 0
Johnson & Phillips	15	15	66/6	..	4 10 3
LancashireDynamo	20	22½	92/–	..	4 18 6
Laurence,Scott(5/–)	12½	12½	13/–	+6d.	4 16 2
London Elec. Wire	7½	7½	33/6	+6d.	4 9 7
Mather & Platt	10	10	51/3	..	3 18 9
Metal Industries(B)	5	8	44/3	..	3 12 2
Met.Elec.CablePref.	5½	5½	21/3	..	5 3 6
Murex	20	20	100/–	+½	4 0 0
Pye Deferred (5/–)	25	25	26/3	+¼	4 15 3
Revo (10/–)	17½	17½	38/9	..	4 10 6
Reyrolle	12½	12½	70/–	..	3 11 5
Siemens Ord.	7½	7½	34/–	..	4 8 3
Strand Elec. (5/–)	7½	10	7/9	..	6 9 0
Switchgear&Cowans (5/–)	10	20	18/–	..	5 11 1
T.C.C. (10/–)	5	5	18/9	..	2 13 4
T.C. & M.	10	10	49/–	..	4 1 8
TelephoneMfg.(5/–)	9	9	11/–	..	4 1 10
Thorn Elec. (5/–)	20	20	21/9	..	4 12 0
Tube Investments	20	20	90/6	+1/–	4 8 6
Vactric (5/–)	Nil	Nil	14/9	..	—
Veritys (5/–)	7½	7½	7/3	..	5 3 5
Vickers (10/–)	10	10	17/6	−3d.	5 14 3
WalsallConduits(4/–)	55	55	45/–	..	4 17 9
Ward & Goldstone (5/–)	20	20	27/3	..	3 13 5
WestinghouseBrake	10	12½	65/–	..	3 17 0
West, Allen (5/–)	7½	7½	6/9	..	5 11 2

* Dividends are paid free of Income Tax.

Stocks and Shares (*Continued from page* 859)

interest in the former company, the cheaper way of doing so is by a purchase of Signals shares. There is at all times a somewhat limited market. It is generally possible, however, to deal in either or both companies' shares at a reasonable margin between the selling and the buying prices.

Free of Tax

Calcutta Electric Supply ordinary and Calcutta Tramway shares have been dull since the Japanese made an air-raid upon the city. This appears to have led to a little uneasiness on the part of holders of the shares, and there have been a few sales which, in the absence of support, depressed the prices of both issues to the extent of a shilling or so. Calcutta Electric Supply ordinary shares receive their dividend free of tax and at 35s. 6d., at which there are 1,000 shares on offer, the yield is £3 7s. 6d. per cent., tax free. The company paid 6 per cent., tax free, for 1942 against 7 per cent. in each of the two preceding years and 8 per cent. for 1939. Another company which pays its dividends tax free is the Palestine Electric. For 1942, the dividend was raised by 1 per cent. to 5 per cent., tax free. Shares are on offer at 41s., giving a return of £2 8s. 6d. per cent. net on the money.

Three More Examples

Lisbon Electric Tramways receive their dividends tax free, and of these shares, 500 are offered at 28s. to give a return of £3 11s. 3d. net on the basis of the 5 per cent. free of tax dividend paid in each of the past two years, which compared with 6¼ per cent. in 1939 and 1940, also tax free. The Rhondda Transport Company paid 5½ per cent., tax free, for 1942 and at to-day's price of 44s., the yield is 2½ per cent. net on the shares. The dividend came down to 5½ per cent. from 9 per cent. paid for 1940 and 1941, all tax free. Some investors prefer to have their dividends paid to them tax free. Whether this is an advantage or not must depend upon the circumstances of each individual case. Globe Telegraph & Trust ordinary make a good example of the popularity with which some of the tax-free-dividend shares are regarded. The price has now risen to 37s. This gives a yield of £2 14s. per cent. net upon the present 5 per cent., tax free.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

ALLMANNA Svenska Elektriska Aktiebolaget.—"Electric high-frequency generators." 15221/41. December 9th, 1940. (557751.)

Associated Electric Laboratories, Inc.—"Static frequency reducers." 17492/42. May 8th, 1942. (557680.)

Automatic Telephone & Electric Co., Ltd., C. Gillings and L. J. Murray.—"Selector switches of the crossbar type as used in automatic telephony." 7223. May 28th, 1942. (557705.)

J. M. Blair.—"Radio-frequency inductance cores and the like." 7209. May 27th, 1942. (557704.)

British Thomson-Houston Co., Ltd.—"Dishwashing apparatus." 17211/42. December 5th, 1941. (557678.) "Vacuum cleaners." 17992/42. December 23rd, 1941. (557683.) "Contact mountings, more particularly for centrifugally operated electric switches." 7804/42. June 6th, 1941. (557725.) "Gas-blast electric circuit-breakers." 7918/42. June 14th, 1941. (557728.)

British Thomson-Houston Co., Ltd., and D. Edmundson. — "Electrical transmission dynamometers." 11645. August 19th, 1942. (557748.)

S. G. Brown and Telegraph Condenser Co., Ltd.—"Manufacture of rolled electric condensers." 5597. April 27th, 1942. (557697.)

Callender's Cable & Construction Co., Ltd.—"Electric cables." 11610/42. August 20th, 1941. (557747.)

Igranic Electric Co., Ltd.—"Electric motor controllers." 7871/42. June 16th, 1941. (557726.)

Landis & Gyr Soc. Anon.—"Automatic electric switch." 17807/42. December 16th, 1941. (557682.) "Mean value indicating apparatus for electricity supply, comprising means for registering the duration of excess values." 17994/42. December 24th, 1941. (557684.)

Marconi's Wireless Telegraph Co., Ltd.—"Diversity receiving systems." 12174/42. August 30th, 1941. (557648.)

Nife Batteries, Ltd., W. S. Thomson and D. W. T. Kirkman.—"Electric storage batteries." 10809. August 1st, 1942. (557745.)

Okonite-Callender Cable Co., Inc. —"Electric cables." 14092/42. October 3rd, 1941. (557653.)

J. Pollock.—"Insulation for electric conductors for fencing or other purposes." August 14th, 1942. (557746.)

E. H. Roberts.—"Electrical transformers." 14237. October 10th, 1942. (557654.)

Sangamo Weston, Ltd.—"Gearing without backlash." 14476/42. October 23rd, 1941. (557657.) "Gearing without backlash." 14477/42. October 23rd, 1941. (557658.) "Electrical resistance elements." 11126/42. September 30th, 1941. (557765.)

L. Satchwell.—"Electric resistance grids." 7492. June 2nd, 1942. (557794.)

Siemens & General Electric Railway Signal Co., Ltd., and J. E. Candler.—"Electric switches for railway and like signalling purposes." 12949. September 14th, 1942. (557649.)

Sigma Instrument Co., Ltd., J. Loxham and F. R. Boosey.—"Automatic electrical integrating and averaging device for a variable medium." 5340. April 21st, 1942. (557782.)

A. M. Smith.—"Transmission of operating impulses to recording apparatus." 14036/41. November 1st, 1940. (557776.)

Standard Telephones & Cables, Ltd.—"Circuits for oscillators." 15700/42. November 19th, 1941. (557670.) "Grid electrodes for electron-discharge devices." 8822/42. June 28th, 1941. (557735.)

Standard Telephones & Cables, Ltd. (International Standard Electric Corporation). —"Amplifier systems, particularly for direct voltage." 17265. December 4th, 1942. (557801.)

Standard Telephones & Cables, Ltd. (Western Electric Co., Inc.).—"Telephone systems." 12510. September 4th, 1942. (557800.)

Standard Telephones & Cables, Ltd., and L. W. Houghton.—"Arrangements for maintaining constant current in electrical circuits." 7301. May 29th, 1942. (557709.)

Standard Telephones & Cables, Ltd., and C. T. Scully.—"Circuit arrangements for resistance elements having a high resistance-temperature coefficient." 7302. May 29th, 1942. (557710.)

Standard Telephones & Cables, Ltd., J. Delves-Broughton and P. N. Delves-Broughton. —"Machines for extruding plastic materials, particularly over electric conductors." 7231. May 28th, 1942. (Addition to 549713.) (557706.)

Standard Telephones & Cables, Ltd., J. A. Leno and J. H. Fearon.—"Electric condensers." 7305. May 29th, 1942. (557713.)

Standard Telephones & Cables, Ltd., E. M. S. McWhirter, and R. H. Dunn.—"Electric testing arrangements employing cathode-ray oscilloscopes." 7303. May 29th, 1942. (557711.) "Generators of electric oscillations." 7304. May 29th, 1942. (557712.) "Supervision of electric power supply circuits." 7454. June 2nd, 1942. (557790.)

Standard Telephones & Cables, Ltd., H. Wolfson and S. C. Shepard.—"Relay timing arrangements." 7232. May 28th, 1942. (557707.)

Standard Telephones & Cables, Ltd., E. M. S. McWhirter, H. Wolfson, R. H. Dunn and S. C. Shepard.—"Electrical relay circuits." 7455. June 2nd, 1942. (557791.)

A. H. Stevens (Holo-Krome Screw Corporation).—"Induction heating apparatus." 8107. June 13th, 1942. (557763.)

H. Ziebolz.—"Devices for measuring force electrically." 16481. November 20th, 1942. (557675.)

CONTRACT INFORMATION

Accepted Tenders and Prospective Electrical Work

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Australia. — QUEENSLAND. — February 11th, 1944. Brisbane City Council. Two (or alternatively three) 600-V mercury-arc rectifiers, each of 1,000 kW rating, together with transformers, high-voltage switchgear, automatic control gear, DC switchgear, supervisory control gear and accessories. Spec. £2 2s. General manager, Department of Transport. (*Tenders*, Melbourne.)

Leyton.—January 6th. Corporation. Traction batteries. (December 17th.)

Manchester.—January 7th. Electricity Committee. Ash sluicing plant, telphers, etc. (December 17th.)

New Zealand.—January 31st. Auckland City Council. Electrically driven pumping plant, capacity 8,000,000 gallons per day, for Lower Nikotupu dam.

Plymouth.—January 1st. Electricity Department. Heat insulating material for steam pipework, feedwater pipework, boiler drums and valves. (December 10th.)

Orders Placed

Barrow - in - Furness.—Watch Committee. Accepted. Wireless equipment for police car (£214).—G.E.C.

Electricity Committee. Accepted. Spare armature (£253).—Metropolitan-Vickers.

Exeter.—Watch Committee. Accepted. Radio communication equipment and installation (£1,190).—G.E.C.

Lichfield.—Electricity Committee. Accepted. Two 3,000-kVA transformers (£3,996). — British Electric Transformer Co.

Middlesbrough. — Corporation. Accepted. Cable (£62).—Britannic Electric Cable & Construction Co.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Bradford.—Works extension; L. & W. Morrell, builders, Moorside Works, Low Moor.

Bromsgrove.—Experimental houses; C. Clarke, builder, Rubery.

Dairy; H. Lane, Hillcrest, Staple Flats.

Coventry.—Rebuilding old petty sessional court buildings; D. E. E. Gibson, city architect, 1a, Warwick Row.

Crieff.—Feeding centre for school children; burgh surveyor.

Croydon.—Art school extension (£1,500); borough engineer.

Darlaston.—School at Moxley; N. H. Hughes, U.D.C. surveyor, Town Hall.

Darlington.—Stores and workshops; R. Eddon & Sons, haulage contractors.

Dartford.—Community centre, Oakfield Lane (£1,068); P. Millar & Son.

Droitwich.—Cottage hospital; J. E. Hulse, borough surveyor, Town Hall.

Dunfermline.—Extension of maternity hospital (£5,500); burgh surveyor.

Easington.—British Restaurant, Heselden; C. W. Clarke, surveyor, R.D.C. offices.

East Boldon.—Canteen at Trimdon Colliery; George Henderson, Boldon Lane, East Boldon, Co. Durham.

East Riding.—Secondary school, Willerby; L. A. Reynolds, county architect, County Hall, Beverley.

Elgin.—Adaptations at Moss Street buildings for British Restaurant (£200); burgh surveyor, South Street.

Epsom & Ewell.—Classrooms at Stoneleigh East Central and West Ewell infants' schools (£3,232); Norman Auty, borough engineer, Town Hall, The Parade, Epsom.

Feltham. — British Restaurant, Hounslow Road, Hanworth; U.D.C. surveyor, Council Offices, Bridge House, Feltham.

Gateshead.—Staff accommodation at Queen Elizabeth Hospital; borough engineer.

Herefordshire.—Additions and adaptations at Ross Grammar School (£1,110); county architect, County Offices, Bath Street, Hereford.

Kesteven.—Farm institute; C. B. Metcalfe, county architect, County Offices, Sleaford.

Kettering.—New headquarters, British Legion; W. F. Mobbs, British Legion Club, Kettering.

Lancaster.—Additional nursery on Greaves House Estate; borough engineer, Town Hall, Dalton Square.

Works; Harrison & Moore, surveyors, 73, Church Street.

Leyton.—Wartime day nursery, Sanderstead Road, Lea Bridge; borough surveyor, Town Hall, Leytonstone, E.10.

Liverpool.—Special school at Crookhey Hall, Cockerham, near Lancaster; L. H. Keay, city architect, Blackburn Chambers, Dale Street.

London.—Enlargement of school of massage, Great Portland Street; National Institute for the Blind, 224, Great Portland Street, London, W

WESTMINSTER. — Reconstruction, Peabody Buildings, Old Pye Street (£5,000) and nursery, Bloomfield Terrace (£2,100); city engineer.

Lowestoft.—Depot additions, Harbour Road; Anglo-American Oil Co.

Manchester.—Works additions; Brierley & Thompson, builders, Union Saw Mills, Bury.

Additions, Hendham Vale Works; Small & Parkes, Ltd., textile machinists, Hendham Vale.

Manea (Peterborough).—Office building; W. E. Cox, School Lane.

Mansfield.—Alterations and additions to Rehabilitation Centre, Berry Hill Hall; Miners'

Welfare Commission, Architects' Department, Ashley Court, Ashtead, Surrey.

Middlesex.—Extensions to County Hospital, Hillington (£11,000) and canteen, Middlesex County Offices (£1,625); county architect.

Montgomeryshire.—Canteen kitchen, Mæsmawr C.E. School; T. G. Davies, director of education, County Offices, Newtown.

Newcastle-on-Tyne.—Nursery with dormitory, etc., Armstrong Road (£3,564); William Hall (Contractors), Ltd., Derwentwater Road, Gateshead.

North Shields.—Hostel; H. D. Burton, Ltd., King Street.

Oldham.—Canteen, Coldhurst Hall Mills; J. Stott, Ltd., cotton spinners, Hartford Mill, Edward Street.

Overseal.—Public hall; F. H. Kirby, chairman, Parish Council, Overseal, Burton-on-Trent.

Pembroke.—Central bus station; town clerk, Main Street.

Portsmouth.—Re-establishment of hospital, site in Commercial Road; Management Committee of the Royal Portsmouth Hospital.

Poynton (Ches.).—Church hall; Rev. J. G. S. Winstanley, St. George's Parish Church.

Rotherham.—Houses on site off Gerard Road and Richard Road; D. Dunk, Ltd., builders, Lilian Street.

Stockport.—Office extensions; Andrew Machine Construction Co., Ltd., Woodbank Works, Turncroft Lane.

Stretford.—Office additions, Trafford Wharf Road; Manchester Dry Docks Co., Ltd.

Swadlincote.—Houses (12), Meadow View Road site; G. S. Baker, U.D.C. surveyor, Council Offices.

Swansea.—Rebuilding out-patients' department and nurses' quarters at Langland; Swansea Hospital Board.

Thame.—Dairy additions, Thame Park Road; J. Holland, Loweswater, Queens Road.
Office and workshops; Styles, Ltd.

Twickenham.—Building, Edwin Road; Gordon Carrington Co., Ltd., builders, Windmill Hill, Ruislip Manor.

Tynemouth.—Factory; Tasker & Child.
Community centre, Percy Main; borough engineer.

Warrington.—Orthopædic department, Town Hall Gardens; Wright & Hamlyn, architects, Winmarleigh Street.

West Hartlepool.—Huts for school meals plan, and extension to Victoria Road nursery; F. Durkin, borough surveyor, Municipal Buildings.

Wiltshire.—Additions for infirmary patients at Stratton and Chippenham (£1,450), accommodation at ten depots (£2,000), and kitchen and dining-room at Malmesbury Secondary School; T. Walker, county architect, County Offices, Trowbridge.

Wolverhampton.—Children's theatre on college site; W. M. Law, borough engineer, Town Hall.

York.—Rebuilding of The Shambles, and remand home and workshops, Hovingham Lodge; C. J. Minter, city engineer, Guildhall.

Henley Students

Annual Conversazione

A large and enthusiastic company assembled for the second annual conversazione of the Henley Students' Association last Saturd. In his address of welcome Mr. A. W. McArthur, M.I.E.E., who presided, said that th number of students showed an appreciabl increase during the year and announced the inauguration of an association known as the Henley Argonauts which all students were a to join, with the object of promoting goo fellowship and social activities. Already ove 50 per cent. of those eligible had become mem bers. He also referred to the very fine displa of technical exhibits and examples of students work. Sir Montague Hughman, chairman o Henley's, distributed awards to successfu students and presented badges to the studen who had joined the Argonauts' Association which he had suggested forming and had spon sored during the year. He recalled that a yea ago he had spoken about the experiment i education which Henley's had made. Th Government White Paper published during th year, containing provisions for part-time educa tion in industry, shows that they were on the right lines in starting the scheme.

After the distribution of awards an addres was given by Mr. P. R. Morris, C.B.E., M.A Director of Education, Kent, who has recently been appointed Director-General of Education to the Forces. He emphasised that "educatio was a lifelong process and not a preparation fo life." Referring to the close association which had grown up between Henley's and the Graves end Technical Institute, he said that this co operation was an indication of the kind of relationship that ought to exist between educa tion and industry. After the war the proposed young people's colleges would mean that educa tion and industry were co-operating in encourag ing the full development of individuals. He stressed the need for care in the selection of young people for particular jobs and that they should be able to assess their own capabilities by systematic and not capricious changes of occupation.

Sir Edward Crowe, K.C.M.G., proposed a vote of thanks to Mr. Morris and paid a warm tribute to his achievements in the educational field.

The interesting series of exhibits and demonstrations was staged by members of Henley's staff and students, one section being devoted to numerous scientific and industrial subjects, while another consisted of examples of boys' handicrafts. These were staged under the direction of the Gravesend Technical Institute staff through the kind services of Mr. H. E. Atherington. Mr. E. Guy, M.Sc., principal of Gravesend Technical Institute, presented the prizes to the successful exhibitors. Alan Randall, one of the students, on their behalf expressed appreciation of the company's scheme and of the personal interest shown by the chairman, the directors and the Education Committee, particularly Dr. Dunsheath, O.B.E., M.A., M.I.E.E. Dr. Dunsheath, in his reply, complimented Randall on his speech, which he said was in itself an eloquent tribute to the value of the work which the Education Committee had in hand.

4, 1943

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